

COOPERATION WORK PROGRAMME 2013¹

(European Commission C(2012) 4536 of 09 July 2012)

¹ In accordance with Articles 179 to 190 of the Treaty on the Functioning of the European Union, and in particular Article 182(1) as contextualised in the following decisions: Decision 1982/2006/CE of the European Parliament and of the Council of 18/12/2006 concerning the Seventh Framework Programme of the European Community for Research, Technological Development and Demonstration (2007 – 2013) and the Council Decision 971/2006/CE of 19/12/2006 adopting a Specific Programme for Research, Technological Development and Demonstration: 'Cooperation' (2007 – 2013).

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General Introduction

The work programme, adopted by the Commission, is the final such exercise under the Cooperation Specific Programme of the Seventh Framework Programme for Research, Technological Development and Demonstration Activities (FP7).

RESEARCH AND INNOVATION – THE KEY DRIVERS FOR NEW GROWTH AND JOBS

Aligned with the Europe 2020 growth and job creation strategy², this work programme is the Union's biggest investment package to date to boost research and innovation. The activities of the work programme have been prioritised and designed to ensure that their outputs and impacts would contribute to and push forward the key policy priorities of the European Union. Additionally this work programme has been tailored to fully fit the policy framework set out with the Innovation Union³, the Europe 2020 flagship initiative aimed at securing Europe's global competitiveness.

In practical terms, activities will address the significant innovation gap the Union is facing, they will build up the knowledge base and they will develop solutions to tackle a number of clearly identified societal challenges facing Europe at large. This work programme is indeed expected to have a significant macro-economic impact over time on European society through its contribution to creating new and sustainable jobs and growth.

FROM FP7 TO HORIZON 2020

The activities under this work programme will also provide for a preparation and smooth transition towards Horizon 2020, the EU's new research and innovation programme covering the period 2014-2020⁴. The 2013 work programme **ushers in new approaches that will be deployed more fully in Horizon 2020**. The final FP7 Cooperation work programme includes in particular the issues outlined below.

a) Facing EU challenges: strategic prioritisation

Across the themes there has been a strong focus on priority areas having a high European added-value, including support to other key EU policies, and a high potential impact. Each priority is anchored in a particular theme, but usually also with a cross-cutting involvement of one or more other themes. The priorities are:

- *Oceans of the future*: Promoting research and innovation on marine technologies, in particular sensors, anti-biofouling materials, and innovative transport and deployment systems for the offshore energy sector. Following joint initiatives in earlier editions of the work programme, a joint call is organised, involving Food, Agriculture and Fisheries and Biotechnology (KBBE), Environment, Transport, Energy, and Nanosciences, Nanotechnologies, Materials and new Production Technologies (NMP).

² Europe 2020: A strategy for smart, sustainable and inclusive growth' COM(2010) 2020 of 3.3.2010.

³ European Commission Communication on 'Europe 2020 Flagship Initiative Innovation Union' (COM(2010) 546 final of 6.10.2010).

⁴ COM(2011)809 of 30.11.2011

- *Water:* Improving the sustainability of natural resources, linked in part to the proposed European Innovation Partnership on Water. This priority is primarily supported under Environment, but with contributions also from ICT, KBBE and, in the Capacities SP, from Science in Society.
- *Raw materials:* Moving European industry away from a resource-intensive basis (relying on raw materials, labour, energy etc.) to one that is more knowledge-intensive and sustainable. Here there are strong links to an important part of a proposed Horizon 2020 challenge and the proposed European Partnership on Raw Materials. This priority is primarily under NMP, with contributions also from Environment.
- *Smart Cities:* Part of the follow-up to the Commission's Communication on this subject; also with strong links to parts of the Public-private partnerships set up under the "Recovery package" (see annex 5). Wide ranging support comes primarily under Energy, ICT, Transport and NMP, but with important contributions also from Environment, Social Sciences and Humanities and, in the Capacities SP, under Science in Society.
- *Secure clean and efficient energy:* Firmly driven by the SET plan⁵, including work on renewable energies and carbon capture and storage; and with strong link to a proposed challenge under Horizon 2020. Support here is primarily under Energy, with contributions from Security, Environment and NMP.
- *Public sector reform:* In the face of the financial and economic crisis, together with an ageing population and an increased dependency ratio with its attendant impact on the public purse, the European welfare state, in its different forms, is under huge pressure. New ways of organising public administrations need to be explored and developed. Relevant initiatives are found under Social Sciences and Humanities, and in the Capacities SP, under the Coherent Development of Research Policies part.
- *Brain research:* Effective and translational brain research can have a major impact on health care costs, estimated at EUR 800 billion in 2010. Support is primarily under Health, with contributions also from KBBE and Social Sciences and Humanities.
- *Anti-microbial resistance:* This follows up on the Commission's recently launched Action plan against the rising threats from antimicrobial resistance⁶; and also in line with commitments to the Millennium Development Goals⁷. Again, support is primarily under Health. There are also contributions from KBBE, NMP, Security, and, in the Capacities SP, under Science in Society.
- *Bio Resource Efficiency:* This priority follows up on the Commission's Bio-Economy Communication⁸, and links as well to the greenhouse gas emission targets. This is strongly focused on KBBE, but with contributions from Social Sciences and Humanities, and Environment.

⁵ COM(2009) 519 final of 7.10.2009.

⁶ 'Action plan against the rising threats from Antimicrobial resistance'. COM(2011)748 final of 15.11.2011.

⁷ Recalled by President Barroso recently in his declaration on the State of the Union at the European Parliament (28/9/2011).

⁸ COM(2012)60 final of 13.2.2012.

- *Europe: a destination for world-class researchers.* This priority underlines the proposed first pillar of Horizon 2020, helping make Europe an attractive place to do excellence research. While excellence science clearly permeates this entire work programme, the mobility aspects are primarily concerns for ERC (Ideas) and Marie Curie (People).

The specific topics that address the above priorities are indicated in the introductory sections of the different themes.

b) Ramping up the innovation dimension

More than ever before, this work programme embraces the full innovation cycle. The goal is to make sure that the fruits of research can be exploited, and to help place new products and services on the market. To this end:

- All themes – except Social Sciences and Humanities – include demonstration, piloting, and validation measures.
- Demand-driven innovation is encouraged, by way of support to pre-commercial public procurement (e.g. ICT, Security, Environment and KBBE); standardisation (e.g. Health, KBBE, ICT, NMP, Environment, Energy, Transport, Security); analysis of regulatory needs (e.g. Health, ICT, KBBE, NMP, Environment, Energy); and actions relevant to existing and possible European Innovation Partnerships (Health, ICT in the case of 'Active and Healthy Ageing'; KBBE in the case of 'Agricultural productivity and sustainability'; NMP and Environment in the case of 'Raw materials'; and Environment in the case 'Water').
- More opportunities for non-technological innovation are provided, including support for public sector innovation (e.g. Prizes and expert groups); social innovation, including transnational networks for incubators (Health, KBBE, Environment, Transport, Social Sciences and Humanities and, in the Capacities SP, CDRP); Service innovation, including process and organisational innovation (e.g. Environment).

c) Enhancing participation of Small and Medium-Sized Enterprises (SMEs).

Innovative SMEs are the seedbeds for new jobs and future growth. We need to help existing ones flourish, and to encourage fresh start-ups. In total 105 topics in this work programme are dedicated in one way or another to SMEs, estimated to lead to around 20% of the total budget share. This includes SME-oriented topics, or topics generally encouraging industrial participants (including SMEs), as well as dedicated calls with strict rules leading to strong SME participation. This includes as well the pilot action begun under Health last year, which in many ways presages the dedicated SME instrument planned for Horizon 2020.

d) Widening Participation

Funding decisions in FP7 are based on the principle of excellence, and not by concerns of geographical return. This will firmly remain the case in the future under Horizon 2020. However, it is important that excellence can flourish wherever it is found, and to ensure that there are no unfair barriers to participation in the programme. To this end, this edition of the work programme includes a number of activities to better understand the challenges and opportunities faced in different parts of Europe in relation to participating in a competitive

research and innovation environment. For example, under Social Sciences and Humanities, a study will look into the reasons for different levels of performance in the Framework Programme; some Themes will carry out mapping exercises or regional research and innovation landscape per sector (e.g. Transport), pointing to where competitive advantages lie.

ERA Chairs:

As part of this issue, while being outside the scope of the Cooperation Specific Programme, a pilot action on the proposed "ERA Chairs" in Horizon 2020 is being prepared for the 2013 work programme covering the Capacities Specific Programme. The aim of the "ERA Chairs" is to attract outstanding academics to institutions with a clear potential for research excellence, in order to help these institutions fully unlock this potential and hereby create a level playing field for research and innovation. Call details for this pilot action are expected to be provided in an update to the related work programme before the end of 2012. The budget is envisaged to be of the order of EUR 12 million.

Over and above these measures in the work programme, there will be a proactive communication effort to ensure that the opportunities offered by the programme are widely known and understood.

e) European Research Area

This work programme contributes to meeting the overarching objective of the EU research policy to develop an open and competitive **European Research Area (ERA)**, which is a core element in the research and innovation agenda of the Commission, as defined in the Innovation Union flagship.

The main premise of ERA is to increase research quality and impact, as well as to raise the attractiveness of the EU as a research location, by exploiting cross-border synergies. This would help to realise research critical mass and economies of scale unattainable at national level. Deficiencies and inefficiencies arising from fragmentation, sub-criticality and duplication in R&D activities, and from a lack of policy coherence and coordination at and between regional, national and European level, could also be overcome. Tackling these depends upon the extent to which high-level political/ ministerial commitment⁹ is matched by concerted action and enhanced partnerships between the Member States and the European Commission; but also research stakeholders as well as concrete research initiatives leading to substantial progress and improvements in research quality, impact and funding efficiency.

In the implementation of the Cooperation Specific Programme, attention is also paid to the working conditions, transparency of recruitment processes, and career development as regards the researchers recruited on projects and programmes funded, for which the Commission Recommendation of 11 March 2005 on the European Charter for Researchers and on a **Code of Conduct for the Recruitment of Researchers**¹⁰ offers a reference framework, while respecting its voluntary nature.

⁹ As endorsed by the Council of the European Union (February 2012), stating that: 'Europe needs a unified research area to attract talent and investment. Remaining gaps must therefore be addressed rapidly and the European Research Area completed by 2014 to create a genuine single market for knowledge, research and innovation. In particular, efforts should be made to improve the mobility and career prospects of researchers, the mobility of graduate students and the attractiveness of Europe for foreign researchers.'

¹⁰ <http://ec.europa.eu/eracareers/europeancharter>

CONSULTATION AND ADVICE

The Cooperation work programme is structured around 10 chapters, which set out the implementation of the research Themes. A range of issues of relevance to the Cooperation work programme as a whole are set out in Annexes 1-5. In general, each chapter is self-standing; however, applicants are advised to read this general introduction and the Annexes, in addition to the chapter(s) containing the research Theme(s) of interest. The 2013 work programme contains a fifth annex, which sets out a series of research topics in three key cross-thematic research initiatives: the Green Cars Initiative; the Energy Efficient Buildings Initiative; and the Factories of the Future Initiative. These three research initiatives will be implemented as public private partnerships in collaboration with key European industrial partners¹¹.

In preparing this work programme, the Commission has relied on advice from a wide range of consultations, including from the European Technology Platforms¹² and from specific advice of a series of advisory groups¹³. The European Technology Platforms provide a framework for stakeholders, led by industry, to define research and development priorities, timeframes and action plans on a number of strategically important issues where achieving Europe's future growth, competitiveness and sustainability objectives is dependent upon major research and technological advances in the medium to long term. The advisory groups are groups of independent, high-level, experts which have been set up by the Commission to advise on the implementation of European Union research policy in each of the ten research Themes contained in this work programme. The experts were chosen based on their knowledge, skills and significant experience in the field of research and aligned issues covered by the Themes. More information on the members, and the work of the advisory groups as well as the European Technology Platforms can be found on the Internet pages of the Seventh Framework Programme.

The Commission is also assisted by the Programme Committee of Member State delegates. The Committee provides an opinion on the draft work programme before it is adopted by the Commission.

¹¹ As set out in the Communication 'A European Economic Recovery Plan'; COM(2008)800 of 26 November 2008.

¹² http://cordis.europa.eu/technology-platforms/home_en.html

¹³ http://ec.europa.eu/research/fp7/advisory_en.html

RESEARCH AND INNOVATION – A WIDE RANGE OF ACTIVITIES

a) Collaborative Research

This specific programme will support a range of research and innovation actions involving the active collaboration of research teams from all sectors, including industry, SMEs, universities and other higher education institutions, research institutes and centres, international European interest organisations, civil society organisations, and any other legal entities. These actions will be implemented through the funding schemes: Collaborative Projects, Networks of Excellence, Research for the Benefit of Specific Groups (in particular SMEs), Coordination and Support Actions, Integrating Activities/Preparatory Phase (Combination of collaborate projects and coordination and support actions) and International Research Staff Exchange Scheme (IRSES).

Collaborative Projects can range from small or medium-scale focused research and innovation actions, to large-scale integrating projects. When a distinction is made between these two types of projects, it will be based – unless specifically otherwise stated – on the size of the European Union contribution requested. The related thresholds may vary for each Theme, and will be specified in the relevant parts of this work programme. It is important to note that these thresholds will constitute eligibility criteria. Additional qualitative aspects may also be given in the relevant parts of this work programme.

Researchers based in Associated Countries may take part in the Cooperation programme on the same basis and with the same rights and obligations as those based in Member States.

b) Pluri-disciplinary and Cross-Thematic Research, Including Calls jointly implemented

Cross-Thematic and pluri-disciplinary research areas are included in this work programme, paying particular attention to key scientific areas such as energy efficiency and marine sciences and technologies. Such cross-Thematic research areas are considered at the topic level, either by a centre of gravity approach with close cooperation of the Themes involved and with the topic presented in the most relevant Theme, or by consideration of the specific topic by both Themes. In certain fields of research, where it is clear that proposals will always contain a high proportion of interest for one of more Themes, there is the potential for calls for proposals jointly implemented or coordinated by one or more Themes to allow for a more focussed approach to such cross-Thematic or pluri-disciplinary research areas.

The 2013 work programme includes e.g. the cross-thematic call "The Ocean of Tomorrow: joining research forces to meet challenges in ocean management" implemented by 5 Themes. Additionally, Theme 3 "ICT" and Theme 5 "Energy" will implement a coordinated call on Smart Cities and Communities in order to contribute to the Commission Initiative on the subject.

c) Adaptation to Evolving Needs and Opportunities

The Cooperation Programme has been designed to be responsive to the changing and evolving research needs of European industry and policy makers. Each Theme includes a range of different research topics, including those relevant to industrial needs, such as those identified in the strategic research agenda for the Technology Platforms, and topics relevant to the formulation, implementation and assessment of EU policies and regulations. In addition, 'emerging' research needs are incorporated through more 'bottom-up' research topics. There is

also provision for the inclusion of research topics related to 'unforeseen policy needs' which may require a quick reaction, as relevant.

d) Coordination of non-Union Research Programmes

The coordination of non-Union research programmes is an important and integral part of the development of the European Research Area. Actions foreseen include the continuation of the ERA-NET scheme and support to the developing Joint Programming Initiatives, support to inter-governmental organisms, such as EUREKA and COST, measures to sustain an active dialog with European High Level Scientific & non-University Research Organisations. Detailed information on these activities is provided in Annex 4 to the Cooperation work programme.

The objective of the ERA-NET scheme is to develop and strengthen the coordination of national and regional research programmes through two specific actions:

- 'ERA-NET actions' - which provide a framework for actors implementing public research programmes to coordinate their activities.
- 'ERA-NET Plus actions' - which can provide additional EU financial support to facilitate joint calls for proposals between national and/or regional programmes.

In 2013, the ERA-NET scheme foresees a cross-thematic call for proposals, open to challenge-oriented strategic priorities. Proposals submitted to the 2013 ERA-NET call shall clearly demonstrate the innovation potential of the planned activities. Participants shall adopt a global approach in their proposals and the presence of partners from relevant non-EU countries will be considered a plus during the proposal evaluation phase. (*The FP7-ERANET-2013-RTD Call Fiche is published in Annex 4*).

The Cooperation programme provides also support for inter-governmental organisms, including funding for the COST secretariat activities and payment of the annual EC membership fee to EUREKA. The dialogue with EIROforum and its members, National Research Councils and other Research Organisations will be sustained in view of improving coordination and improving the efficiency of trans-national research collaborations.

e) Risk-Sharing Finance Facility

Commitment No. 10 of the Innovation Union Flagship Initiative is to increase private finance and close the market gap in investing in Research, Development and Innovation (RDI). The European added-value of public support is to overcome market gaps for the financing of European RDI with a high level of risk.

In accordance with Annex III to the Cooperation Specific Programme, the European Union (EU) provides a contribution to the European Investment Bank (EIB) for a Risk-Sharing Finance Facility (RSFF). The objective is to foster primarily private sector investment in research, technological development and demonstration as well as innovation¹⁴. The EIB designed this debt financial instrument with the Commission with the financial support of the EU.

¹⁴ Costs related to Innovations activities may be considered as eligible EU RSFF Operations if they comply with the provisions set in the RSFF cooperation agreement between the European Union and the European Investment Bank (as stated in Article A4.6.2: Selection of Projects for Financing and the Eligibility Criteria under Annex IV).

In compliance with the Cooperation Specific Programme, "Joint Technology Initiatives, Collaborative Projects, Networks of Excellence and Research for the benefit of SMEs funded by the EU shall be automatically eligible for the RSFF provided their objectives fall within the scope of the contributing themes of this Specific Programme. Legal entities established in third countries other than Associated Countries are also eligible if they participate in the above mentioned FP7 indirect actions and their costs are eligible for Community funding".

In December 2011, the Commission and the EIB responded to the European Council's and European Parliament's requests to develop and improve the RSFF through an amendment to the RSFF cooperation agreement. The EU now assumes a higher risk aiming at a higher multiplying effect of its contribution. The RSI (Risk-Sharing Instrument for SMEs and smaller midcaps) has also been created. This new RSFF facility incentivises banks to provide loans to innovative SMEs and small mid-sized firms investing in RDI. The European Investment Fund (EIF) manages this facility as an intermediary of the EIB.

The last year of FP7 is also a preparatory phase for the development of innovative financial instruments for RDI under the proposed Horizon 2020, to notably better support innovative SMEs. Therefore, the RSFF focus for 2013 is on maximising the implementation level for target groups that have so far been relatively less attracted to the RSFF, for example innovative SMEs under the Cooperation Specific Programme.

Annex 4 to this work programme gives more information on the RSFF.

f) Joint Technology Initiatives

Joint Technology Initiatives (JTIs) address fields of major European public interest, focussed on well-defined areas of strategic importance for the competitiveness of European industry. These have been identified in the areas of Innovative Medicines (IMI), 'Clean Sky', Embedded Computing Systems (ARTEMIS), Nanoelectronics (ENIAC) and Fuel Cells and Hydrogen (FCH). JTIs will strengthen links between the research community and industry, thus facilitating the commercialisation of research results and reducing time-to-market and complementing this work programme. After the Council adopted the Regulations for the JTIs they started their operations. Further information on the JTIs can be found on the Internet pages of the Seventh Framework Programme.

INTERNATIONAL COOPERATION DIMENSION

Research cooperation with international partners is an important objective of the Seventh Research Framework Programme. Under the Cooperation Specific Programme, research cooperation with international partners is implemented in the following ways:

- Legal entities from countries associated to the framework programme can participate under the same terms and conditions as those established in the EU Member States. The countries currently associated are: Albania, Bosnia & Herzegovina, Croatia, Faroe Islands, the Former Yugoslav Republic of Macedonia, Iceland, Israel, Lichtenstein, Moldova, Norway, Montenegro, Serbia, Switzerland and Turkey.
- Through the principle of general opening up of all research activities, the participation of legal entities from all third countries is allowed, i.e. from high income countries as well as from middle and low income countries, the latter two being identified as International Cooperation Partner Countries (ICPC) (see list of countries considered as ICPC in Annex 1). Legal entities from the associated countries and the ICPC list are eligible for funding. Legal entities from the other third countries and international organisations are eligible for funding under the conditions laid down in Art 29 (2) of the Rules for Participation.
- Some topics in the work programme, in areas of mutual interest and benefit, may target the participation of legal entities from a specific third country, from a group of countries, or from a region. In this case, the active participation of the relevant third country partner or partners should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken. These aspects will be considered specifically during the evaluation.

The participation of third countries may also be implemented in the form of specific measures such as coordinated calls, twinning of projects, use of matching funds or mutual opening.

- Through the Specific International Cooperation Actions (SICAs), research cooperation can be dedicated to given countries/regions on the ICPC list. The SICA topics are of mutual interest and identified in the work programmes per theme. It should be noted that in the case of SICAs the participation of the targeted countries/regions is an eligibility condition in the Collaborative Projects. Unless specifically stated, there are no such specific participation criteria for Coordination and Support Actions targeted at ICPCs. Depending on the nature and the expected impact of these actions, the participation of third countries in such projects could, however, be considered essential. Further information on these criteria is given in each theme and also in the relevant Guide for Applicants.

The inclusion of international partners is particularly relevant where such participation contributes to the innovative potential of the proposal concerned. This should take account of the potential exploitation of IPR and should be reflected within the description of the criterion 'Impact' in the proposal.

DISSEMINATION, KNOWLEDGE TRANSFER AND GENDER ISSUES¹⁵

FP7 is working to develop a better relationship between scientists and European citizens. With this aim in mind, the work programme will encourage activities to promote greater public engagement and dialogue in order to involve citizens and civil society organisations in research and science policy.

The pursuit of scientific knowledge and its technical application towards society requires the talent, perspectives and insight that can only be assured by increasing diversity in the research workforce. Therefore, all projects are encouraged to have a balanced participation of women and men in their research activities and to raise awareness on combating gender prejudices and stereotypes. When human beings are involved as users, gender differences may exist. These will be addressed as an integral part of the research to ensure the highest level of scientific quality.¹⁶ In addition, specific actions to promote gender equality in research can be financed as part of the proposal, as specified in Appendix 7 of the Negotiation Guidance Notes.¹⁷

With the aim of encouraging young people's interest in science and science studies, account will be taken of the possible relevance of research results for the purposes of science education. Where appropriate, communication and dissemination strategies will address the wider audience of policy-makers, the media and the general public (including young people), in order to promote increased understanding between the scientific world and society at large.

In order to strengthen the diffusion and use of the output of EU research, the dissemination of knowledge and transfer of results, including to policy makers and to the managing authorities of the Cohesion Policy funds¹⁸, will be supported in the Themes (see also Annex 4 for further information on CORDIS). In addition, specific Internet pages of the Seventh Framework Programme also provide applicants with full details of the calls for proposals open under this work programme, together with all of the documentation necessary to make an application

As from 20 August 2008¹⁹, the Cooperation Themes Health, Energy, Environment, Information and Communication Technologies (*Challenge 2*), as well as Socio-Economic Sciences and the Humanities have been involved in the FP7 Open Access. Participants to their projects will be required to deposit peer-reviewed articles resulting from projects to an institutional or subject-based repository, and to make their best efforts to ensure open access to these articles within a specified period, usually six months.

¹⁵ Objectives related communication and dissemination, knowledge transfer and gender issues will be addressed during the contract negotiation.

¹⁶ Case studies are presented at www.genderedinnovations.eu

¹⁷ Available from : ftp://ftp.cordis.europa.eu/pub/fp7/docs/negotiation_en.pdf

¹⁸ http://ec.europa.eu/regional_policy/atlas2007/fiche_index_en.htm

¹⁹ C(2008) 4408 final of 20.08.08

PRACTICAL MODALITIES

This work programme provides additional detail of the implementation of the Specific Programme, setting out information on the priorities, objectives and policy relevance of the research topics which will be implemented through calls for proposals in the latter half of 2012 and in 2013.

a) Submitting a Proposal

Proposals should be submitted in accordance with the terms set out in a call for proposals. In order to submit a proposal, applicants should consult the following documents:

- The text of the call for proposals, as announced in the Official Journal of the European Union, and published on the specific Internet pages of the Seventh Framework Programme
- This work programme, including the General introduction and the Annexes; and
- The relevant Guide for Applicants

There are also a number of other useful texts, which applicants could refer to, including the Specific Programme 'Cooperation', the Rules for Participation for FP7, the Guidelines on Proposal Evaluation and Project Selection Procedures, and the Commission Recommendation on the European Charter for Researchers and on a Code of Conduct for the Recruitment of Researchers. These documents, and other relevant background documents, are available on the Internet pages of the Seventh Framework Programme. Proposals should also be consistent with national legislation implementing Directive 95/45/EC of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data²⁰.

The forms of the grant which will be used and the maximum reimbursement rates for projects funded through the Cooperation work programme are set out in Annex 3 and are applicable to actions as a result of calls for proposals and grants to identified beneficiaries²¹, unless indicated otherwise in the Themes. Participants will also have the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions²².

Every Member State and Associated country has appointed a set of National Contact Points (NCPs) to assist potential and successful applicants. There is a NCP for each of the Themes of the Cooperation Programme. Applicants are encouraged to make contact with the relevant NCP from their country.

b) Evaluation Criteria and Related Issues

The 'Rules for Submission of Proposals and the Related Evaluation, Selection and Award Procedures' set out the basic procedures to be followed by all programmes under the Seventh Framework Programme.

²⁰ OJ L 281 of 23.11.1995, p. 31

²¹ According to Article 13 and Article 14 (a) of Regulation No 1906/2006 of the European Parliament and of the Council of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013) OJ L391 of 30.12.2006.

²² Not available in the case of the ICT Theme.

The set of eligibility and evaluation criteria for this work programme is given in Annex 2 and is applicable to actions as a result of calls for proposals and grants to identified beneficiaries²¹, unless indicated otherwise in the Themes. Any complementary criteria, which may apply, are clearly set out in the relevant chapter of this work programme and in the text of the calls for proposals.

All proposals which deal with ethical issues and all proposals for which ethical concerns have been identified during the evaluation process may be reviewed by a separate ethical evaluation panel, before they can be selected for funding. Further information on this ethical review and all aspects of the evaluation procedure are given in the 'Rules on Submission of Proposals and the Related Evaluation, Selection and Award Procedures'.

The work programmes, and consequently the calls for proposals, may specify and restrict the participation of legal entities, according to their activity and type, or according to the funding scheme used.

Calls for proposals may involve a two-stage submission and/or a two-step evaluation procedure. When such a procedure is employed, this is clearly stated in the text of the call for proposals and the Guides for Applicants. More information on two-stage submission and two-step evaluation is given in the 'Rules on Submission of Proposals and the Related Evaluation, Selection and Award Procedures'.

In carrying out the evaluations of proposals received, the Commission may chose to send the proposals to external experts, or to make the proposals available electronically, so that the experts may carry out their examination and review of the proposals at their home and/or their place of work.

c) Ethical Aspects

All research carried out under this work programme must respect fundamental ethical principles and legislation as well as, and the requirements set out in the text of the Cooperation Specific Programme. More information on the procedures for the peer and ethics review of submitted proposals is given in the 'Rules for Submission of Proposals, and the Related Evaluation, Selection and Award Procedures'.

The Commission is fully committed to the principles set out in:

- a) The Charter of Fundamental Rights of the European Union as well as in the relevant EU legislation
- b) The declaration on the use of human embryonic stem cells, as set out in the annex to the Commission Communication COM(2006)548 of 26 September 2006²³. This states that the Commission will maintain the practice of the 6th Framework Programme. Accordingly, the Commission will not fund projects which include research activities which destroy human embryos, including for the procurement of stem cells. The exclusion of funding of this step of research will not prevent Community funding of subsequent steps involving human embryonic stem cells.

²³ OJ L 412 of 30.12.2006, p. 42

d) Prior Information of Candidates, Tenderers and Grant Applicants

(Article 8 of Decision on the EWS and Article 13 of Regulation on the Central Exclusion Database)

The Commission uses an internal information tool (EWS), as well as a database available to public authorities implementing EU funds (CED) to flag identified risks related to beneficiaries of centrally managed contracts and grants with a view to protecting the EU's financial interests.

Candidates, tenderers, grant applicants and, if they are legal entities, persons who have powers of representation, decision-making or control over them, are informed that, should they be in one of the situations mentioned in:

- the Commission Decision of 16.12.2008 on the Early Warning System (EWS) for the use of authorising officers of the Commission and the executive agencies (OJ, L 344, 20.12.2008, p. 125), or
- the Commission Regulation of 17.12.2008 on the Central Exclusion Database – CED (OJ L 344, 20.12.2008, p. 12),

their personal details (name, given name if natural person, address, legal form and name and given name of the persons with powers of representation, decision-making or control, if legal person) may be registered in the EWS only or both in the EWS and CED, and communicated to the persons and entities listed in the above-mentioned Decision and Regulation, in relation to the award or the execution of a procurement contract or a grant agreement or decision.

More information on the EWS and CED can be found at the following address:
http://ec.europa.eu/budget/sound_fin_mgt/ews_en.htm

e) Budget Figures in This Work Programme

This work programme draws on financing from the 2013 budgetary year. All budgetary figures given in this work programme are indicative. Unless otherwise stated, final budgets may vary following the evaluation of proposals.

The final budget awarded to actions implemented through calls for proposals may vary:

- The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

For actions not implemented through calls for proposals:

- The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions;
- The final budget awarded for all other actions not implemented through calls for proposals may vary by up to 10% of the indicated budget for these actions.

WORK PROGRAMME 2013

COOPERATION

THEME 1

HEALTH

(European Commission C(2012) 4536 of 09 July 2012)

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Objective: Improving the health of European citizens and increasing the competitiveness and boosting the innovative capacity of European health-related industries and businesses while addressing global health issues including emerging epidemics. Emphasis will be put on translational research (translation of basic discoveries in clinical applications including scientific validation of experimental results) the development and validation of new therapies, methods for health promotion and prevention including promotion of child health, healthy ageing, diagnostic tools and medical technologies, as well as sustainable and efficient healthcare systems.

I CONTEXT

Political landscape

The Theme Health is aligned with the fundamental objectives of EU research policies: improving the health of European citizens and increasing competitiveness of European health-related industries and services, as well as addressing the socio-economic dimension of health care and global health issues.

Against the backdrop of the current economic situation and increased global competition, the Union has defined a strategy to support growth and job creation, Europe 2020¹. Research and innovation are key drivers of competitiveness, jobs, sustainable growth and social progress.

The priority setting for the last work programme of the Seventh Framework Programme (FP7) will **respond to the major health-related socio-economic and societal challenges** in view of the new orientations given by the **Europe 2020 Strategy** including complementing efforts undertaken by the Innovation Union flagship initiative², the European Innovation Partnership (EIP) for “active and healthy ageing”³. In this way the work programme provides for a smooth transition towards the new research and innovation programme for 2014-2020, **Horizon 2020**⁴; for instance by strengthened priorities contributing to putting knowledge into practice and enhance the socio-economic impact of research following the **Europe 2020 strategy** with more industry-driven applied research **to boost innovation** in the health sector including social innovation. There is a determined focus on fostering new ideas, supporting world class teams tackling significant societal challenges, and on ensuring that the fruits of our investments can be properly exploited.

With its many **broad, bottom-up topics** suited for SMEs, this work programme will (**over 20% of the budget ring-fenced for SMEs and industry**) contribute very significantly to the **European renewal**⁵ while continuing "to secure world excellence in basic research" (Barroso, 2009⁶) through large-scale collaborative research efforts.

¹ Europe 2020 A strategy for smart, sustainable and inclusive growth COM(2010) 2020;

² Communication from the commission to the European parliament, the council, the European economic and social committee and the committee of the regions, Europe 2020 Flagship Initiative, Innovation Union; SEC(2010) 1161;

³ COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL Taking forward the Strategic Implementation Plan of the European Innovation Partnership on Active and Healthy Ageing. COM/2012/083 final http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/steering-group/implementation_plan.pdf#view=fit&pagemode=none

⁴ Horizon 2020 - The Framework Programme for Research and Innovation, COM(2011) 808 final;

⁵ European renewal – State of the Union Address 2011, Barroso 28 September 2011, speech/11/607;

⁶ Political Guidelines for the New Commission, J.M. Barroso, 2009;

Approach for 2013

This work programme further consolidates the major efforts initiated in 2011 and 2012 to stimulate innovation and SME participation via **broad, bottom-up topics** implemented by the two-stage submission and evaluation procedure. Such activities complement the on-going public-private partnership with the pharmaceutical industry, the Innovative Medicine Initiative⁷ (IMI). Overall this work programme continues to support top quality collaborative research including standardisation aspects in several topics of various areas. Coordination with other themes will also be assured in the relevant areas.

While this work programme as a whole takes into account the coverage of the specific programme, it also contributes to achieving the research and innovation goals inherent in developing a European innovation economy. The small number of areas prioritised allows the mobilisation of a critical mass of resources and the implementation of a coherent set of actions, to ensure greater effectiveness, impact and visibility.

For translational applied projects standardisation is often a key enabler for interoperability; ensures product quality, open markets and free trade and thereby building consumer confidence. Standardisation can help to foster future access to the market of innovative solutions and thus help ensure the practical application of research results. As such, projects could strengthen future innovation by considering the inclusion of pre- and co-normative research tasks and the integration of standardisation organisations to support standardisation.

Key Challenges/objectives

The Health work programme 2013 has an indicative budget of EUR ~840 million to cover many health issues. **The research priorities for 2013 are: brain research, antimicrobial drug resistance and comparative effectiveness research**, complemented by topics from other areas such as developing personalised medicines approaches, cardiovascular research, safety and efficacy of therapies, cancer and public health research and a **horizontal activity for translating research results into innovative applications for health**.

Brain research is an area where the scientific challenges are enormous and where society realises that considerable new investments are needed to respond to the concerns of Member States (MS), European Parliament (EP), European Commission, general directorate for health and consumers (DG SANCO), learned societies, and many other stakeholders which are very supportive to these actions. Effective translational brain research can alleviate human suffering and have a major impact on economic and health care costs, EUR 800 billion in 2010⁸. Topics are:

HEALTH.2013.2.2.1-1: Prospective longitudinal data collection and Comparative Effectiveness Research (CER) for traumatic brain injury (TBI).

HEALTH.2013.2.2.1-2: Development of effective imaging tools for diagnosis, monitoring and management of mental disorders

HEALTH.2013.2.2.1-3: Paediatric conduct disorders characterised by aggressive traits and/or social impairment: from preclinical research to treatment.

HEALTH.2013.2.2.1-4: Patho-physiology and therapy of epilepsy and epileptiform disorders.

HEALTH.2013.2.2.1-5: Understanding and controlling pain.

⁷ The Innovative Medicines Initiative, a public-private partnership between the European Commission and the European Federation of Pharmaceutical Industries and Association (EFPIA); reference to IMI Regulation.

⁸ Gustavsson et al.: "Cost of disorders of the brain in Europe 2010". European Neuropsychopharmacology (2011) 21, 718–779

Comparative Effectiveness Research (CER) has not been addressed in FP7 before and will bridge to planned activities of Horizon 2020 where CER would be further supported. Tackling this issue is of high importance for citizens, in particular as it addresses benchmarking and identification of best practice in particular with patient outcomes in different domains. Topics are:

- HEALTH.2013.2.2.1-1: Prospective longitudinal data collection and Comparative Effectiveness Research (CER) for traumatic brain injury (TBI).
- HEALTH.2013.2.4.2-2: Comparative effectiveness research of existing technologies for prevention, diagnosis and treatment of cardiovascular diseases.
- HEALTH.2013.3.1-1: Comparative effectiveness research (CER) in health systems and health services interventions.

Making an effort in the area of **antimicrobial drug resistance (AMR)** corresponds to planned activities under Horizon 2020 and addresses a major concern of European citizens. In addition to the innovation aspects and the need for a sustainable approach, it is in line with the Commission's commitment to the Millennium Development Goals⁹. Topics are:

- HEALTH.2013.2.3.1-1: Drugs and vaccines for infections that have developed or are at the risk of developing significant anti-microbial resistance.
- HEALTH.2013.2.3.1-2: Stratified approaches to antibacterial and/or antifungal treatment.

Innovation dimension of the activities and bridging towards planned activities under Horizon 2020

The focus on innovation is reflected in the description of the objectives and scope of the specific topics, as well as in the expected impact statements. The innovation dimension of the proposals will be evaluated under the 'Impact' evaluation criterion.

Several topics tackling issues such as antimicrobial resistance, comparative effectiveness research, social innovation, support for SMEs and medical technologies have clear links to planned activities under Horizon 2020, especially with regard to the concerns of the citizens and the specific programmes "Tackling Societal Challenges" (TSC) and "Industrial Leadership and Competitive Frameworks" (ILCF). About half of the topics address issues of direct concern to citizens. More than half of the topics are related to TSC, several topics contribute to prepare the ground for ILCF in health (bio)technologies, all together with an indicative budget of over EUR ~400 million. Furthermore, Theme Health continues to pilot specific SME-targeted topics with 50% ring-fenced budgets for SMEs. With 11 topics¹⁰ this call takes account of relevant aspects of the Strategic Implementation Plan established by the EIP on 'Active and Healthy Ageing' and contributes to its aims.

⁹ Recalled by President Barroso recently in his declaration on the State of the Union at the European Parliament (28/9/2011).

¹⁰ In certain cases topic titles have been shortened. HEALTH.2013.1.2-1: Imaging technologies for therapeutic interventions in rare diseases; HEALTH.2013.1.3-2: Immune reactions to biomedical devices, implants and transplant tissues; HEALTH.2013.1.4-1. Controlling differentiation and proliferation in human stem cells intended for therapeutic use; HEALTH.2013.2.1.1-1: Functional validation in animal and cellular models of genetic determinants of diseases and ageing processes; HEALTH.2013.2.1.1-2: Metagenomics for personalised medicine approaches; HEALTH.2013.2.3.1-2: Stratified approaches to antibacterial and/or antifungal treatment; HEALTH.2013.2.4.1-2: Strengthening the cancer patient's immune system; HEALTH.2013.2.4.1-3: Palliative care clinical trials and observational studies; HEALTH.2013.3.1-1: Comparative Effectiveness Research (CER) in health systems and health services interventions; HEALTH.2013.3.3-1: Social innovation for health promotion; HEALTH.2013-4.2-1: Investigator-driven clinical trials for off-patent medicines.

- **SME-relevant research:** Promoting innovation by strengthening the links between academia and industry is the driving force of this work programme. Broad, SME and/or industry including SMEs-relevant topics¹¹ (at about 60 % of all topics) are set out in areas of great interest to SMEs, such as medical technologies, and where, for each project, a minimum of 15%, 30% or 50% of EU funding shall go to SMEs and/or industry. It is expected that about 20% of the total budget for 2013 will be awarded to SMEs in collaborative projects
- **Dissemination actions:** The health market is highly fragmented in Europe, with different public health policies in Member States and Associated Countries. To sustain the competitiveness of the health sector, it is necessary to improve the framework conditions for business to innovate in creating the single EU Patent and a specialised Patent Court, in harmonising the regulatory framework, in improving access of SMEs to intellectual property protection (IPR). Therefore in 2013 an action is included for health research projects to address the innovation lifecycle by boosting the translation of projects' results into innovative applications for health.
- **Open Access in FP7:** Beneficiaries funded partially or entirely by the Cooperation Programme under the Health Theme are required to deposit peer-reviewed articles resulting from projects to an institutional or subject-based repository, and to make their best efforts to ensure open access to these articles within six months¹².
- **Overall expected impact:** It is evident that projects generated through this work programme will contribute to various social innovations in the health sector, independently of whether they are related to medical technologies, ageing, health care, specific diseases and/ or disorders. A conservative estimate suggests that ~EUR 160 million (about ~20% of the indicative budget of the calls) will be allocated to SMEs. Topics of relevance to the innovation partnership (including those on medical technologies) have a total budget of ~ EUR 300 million (~40%). These efforts should increase the drive to develop new technologies, new vaccines, new drugs, as well as new therapies and thus contribute to *i-economy* goals in the health sector, while improving the quality of life of people in Europe and around the world. In addition to topics with a

¹¹ In certain cases topic titles have been shortened. HEALTH.2013.0-1: Boosting the translation of FP projects' results into innovative applications for health; HEALTH.2013.1.2-1: Imaging technologies for therapeutic interventions in rare diseases; HEALTH.2013.1.3-1: Modelling toxic responses in case studies for predictive human safety assessment; HEALTH.2013.1.3-2: Adverse immune reactions to biomedical devices, implants and transplant tissues; HEALTH.2013.1.3-3: Safety and efficacy of therapeutic vaccines; HEALTH.2013.1.3-4: Development of alternative in vitro, analytical, immunochemical, and other test methods for quality control of vaccines; HEALTH.2013.1.4-1: Controlling differentiation and proliferation in human stem cells intended for therapeutic use; HEALTH.2013.2.1.1-1: Functional validation in animal and cellular models of genetic determinants of diseases and ageing processes; HEALTH.2013.2.1.1-2: Metagenomics for personalised medicine approaches; HEALTH.2013.2.2.1-2: Effective imaging tools for diagnosis, monitoring and management of mental disorders; HEALTH.2013.2.2.1-3: Paediatric conduct disorders characterised by aggressive traits and/or social impairment; HEALTH.2013.2.2.1-4: Patho-physiology and therapy of epilepsy and epileptiform disorders; HEALTH.2013.2.3.0-1: Innovation in vaccines; HEALTH.2013.2.3.1-1: Drugs and vaccines for infections that have developed or are at the risk of developing significant anti-microbial resistance; Health.2013.2.3.4-2: Drug development for neglected parasitic diseases; HEALTH.2013.2.4.1-2: Strengthening the cancer patient's immune system; HEALTH.2013.2.4.2-1: Novel targets for cardiovascular disease treatment; HEALTH.2013.3.3-1: Social innovation for health promotion; HEALTH.2013.4.2-1: Investigator-driven clinical trials for off-patent medicines; HEALTH.2013.4.2-2: Adverse drug reaction research.

¹² Further information: http://cordis.europa.eu/fp7/find-doc_en.html
<http://ec.europa.eu/research/sciencesociety/>

focus on providing support to SMEs, certain topics¹³ also support the aims and objectives of the Innovation Union, including the support to proof of principle¹⁴; the involvement of end-users (both patient and health professionals) in product development and implementation¹⁵; the anticipation of regulatory needs¹⁶; the focus on standardisation¹⁷; addressing market failure¹⁸; harnessing social innovation¹⁹;

¹³ In certain cases topic titles have been shortened.

¹⁴ HEALTH.2013.0-1: Boosting the translation of FP projects' results into innovative applications for health; HEALTH.2013.1.3-2: Adverse immune reactions to biomedical devices, implants and transplant tissues; HEALTH.2013.1.4-1: Controlling differentiation and proliferation in human stem cells intended for therapeutic use; HEALTH.2013.2.1.1-1: Functional validation in animal and cellular models of genetic determinants of diseases and ageing processes; HEALTH.2013.2.1.1-2: Metagenomics for personalised medicine approaches; HEALTH.2013.2.3.0-1: Innovation in vaccines; HEALTH.2013.2.3.1-1: Drugs and vaccines for infections that have developed or are at the risk of developing significant anti-microbial resistance; HEALTH.2013.2.3.1-2: Stratified approaches to antibacterial and/or antifungal treatment; HEALTH.2013.2.4.1-1: Investigator-driven treatment trials to combat or prevent metastases in patients with solid cancer; HEALTH.2013.2.4.1-2: Strengthening the cancer patient's immune system; HEALTH.2013.2.4.1-3: Palliative care clinical trials and observational studies; HEALTH.2013.2.4.2-1: Novel targets for cardiovascular disease treatment; HEALTH.2013.3.1-1: Comparative Effectiveness Research (CER) in health systems and health services interventions; HEALTH.2013.4.2-1: Investigator-driven clinical trials for off-patent medicines.

¹⁵ HEALTH.2013.1.2-1. Imaging technologies for therapeutic interventions in rare diseases; HEALTH.2013.1.3-2: Adverse immune reactions to biomedical devices, implants and transplant tissues; HEALTH.2013.2.3.3-1: Clinical management of patients in severe epidemics; HEALTH.2013.2.4.1-3: Palliative care clinical trials and observational studies; HEALTH.2013.3.1-1: Comparative Effectiveness Research (CER) in health systems and health services interventions; HEALTH.2013.3.3-1: Social innovation for health promotion.

¹⁶ HEALTH.2013.1.3-1: Modelling toxic responses in case studies for predictive human safety assessment; HEALTH.2013.1.3-2: Adverse immune reactions to biomedical devices, implants and transplant tissues; HEALTH.2013.1.3-4: Development of alternative in vitro, analytical, immunochemical, and other test methods for quality control of vaccines; HEALTH.2013.1.4-1. Controlling differentiation and proliferation in human stem cells intended for therapeutic use; HEALTH.2013.2.4.1-1: Investigator-driven treatment trials to combat or prevent metastases in patients with solid cancer; HEALTH.2013.2.4.1-2: Strengthening the cancer patient's immune system; HEALTH.2013.2.4.2-1: Novel targets for cardiovascular disease treatment; HEALTH.2013.2.4.2-2: Comparative effectiveness research of existing technologies for prevention, diagnosis and treatment of cardiovascular diseases; HEALTH.2013.4.1-2: Interactions between EU legislation and health research and/or innovation; HEALTH.2013.4.2-1: Investigator-driven clinical trials for off-patent medicines using innovative, age-appropriate formulations and/or delivery systems; HEALTH.2013.4.2-2: Adverse drug reaction research; HEALTH.2013.4.2-3: New methodologies for clinical trials for small population groups.

¹⁷ HEALTH.2013.1.2-1. Imaging technologies for therapeutic interventions in rare diseases; HEALTH.2013.1.3-4: Development of alternative in vitro, analytical, immunochemical, and other test methods for quality control of vaccines; HEALTH.2013.1.4-1. Controlling differentiation and proliferation in human stem cells intended for therapeutic use; HEALTH.2013.2.1.1-1: Functional validation in animal and cellular models of genetic determinants of diseases and ageing processes; HEALTH.2013.2.2.1-1: Prospective longitudinal data collection and Comparative Effectiveness Research (CER) for traumatic brain injury (TBI); HEALTH.2013.2.4.2-1: Novel targets for cardiovascular disease treatment; HEALTH.2013.2.4.2-2: Comparative effectiveness research of existing technologies for prevention, diagnosis and treatment of cardiovascular diseases; HEALTH.2013.4.2-3: New methodologies for clinical trials for small population groups.

¹⁸ HEALTH.2013.2.3.1-1: Drugs and vaccines for infections that have developed or are at the risk of developing significant anti-microbial resistance; HEALTH.2013.2.3.1-2: Stratified approaches to antibacterial and/or antifungal treatment; Health.2013.2.3.4-1: Neglected infectious diseases of Central and Eastern Europe; Health.2013.2.3.4-2: Drug development for neglected parasitic diseases.

¹⁹ HEALTH.2013.2.4.1-3: Palliative care clinical trials and observational studies; HEALTH.2013.3.1-1: Comparative Effectiveness Research (CER) in health systems and health services interventions; HEALTH.2013.3.3-1: Social innovation for health promotion.

the translation and dissemination of results²⁰.

International Cooperation

Theme Health is addressing multiple issues related to international cooperation: tackling global challenges, such as emerging epidemics; neglected diseases (of interest for many EU and neighbourhood countries); improving the competitiveness of the European science base and industry through global cooperation; supporting external relations of the EU, noting that health issues, including health research are shared between all countries, rich and poor and to join forces, to avoid duplication and speed up developments in large scale initiatives. All topics under the FP7-HEALTH-2013-INNOVATION-1 call are open for the participation of partners from third countries and offer many opportunities for "bottom-up" international collaboration. In recognition of the opening of NIH²¹ programmes to European researchers, participants established in the *United States of America* are entitled to participate and to receive funding in all topics under the FP7-HEALTH-2013-INNOVATION-1 call. Specific programme level cooperation is foreseen with the US and Canada in the field of brain injury, and further support for rare diseases contributing to the international consortium in rare diseases, now counting more than 23 funding entities.

Cross-thematic approaches

Theme Health again contributes with a number of topics to the EIP "active and healthy ageing". The research part of this EIP will be established by Themes Information and Communication Technologies (ICT); Health; Food, Agriculture, Fisheries and Biotechnology (KBBE) and Socio-economic Sciences and the Humanities (SSH). Furthermore Theme Health is complemented by several topics from Themes ICT; KBBE and Nanosciences, Nanotechnologies, Materials and new Production Technologies (NMP).

Theme specific information

With regard to submission, evaluation and selection procedures, the major simplification introduced with work programme 2012 continues for 2013 by implementing the Health work programme via the **two-stage submission and evaluation procedure**. The implementation will be via two calls: **FP7-HEALTH-2013-INNOVATION-1 as main call** with an indicative budget of **EUR 680 million** with **broader topics** of which **many are tailored for SME participation** (bottom-up with a minimum percentage of EU funding requested going to SMEs) and **FP7-HEALTH-2013-INNOVATION-2 as a specific call to boost SME participation for innovative solutions in the health sector** with an indicative budget of **EUR 140 million**. This call has very specific conditions (see section III of this document).

In general, applicants are reminded that the **minimum number of applicants** in most funding schemes (except support actions) is 3 (**see section III, Implementation**); however **there is no obligation imposed on the applicants to go beyond this number unless additional partners are needed to achieve the objectives of the project**. Likewise the duration of the project will be in line with the realistic planning of the project and so, may be quite short (e.g. 1-2 years), or long enough to achieve the goals of the project with the exception of topics

²⁰ HEALTH.2013.2.1.1-2: Metagenomics for personalised medicine approaches; HEALTH.2013.2.2.1-1: Prospective longitudinal data collection and Comparative Effectiveness Research (CER) for traumatic brain injury (TBI); HEALTH.2013.2.4.2-2: Comparative effectiveness research of existing technologies for prevention, diagnosis and treatment of cardiovascular diseases; HEALTH.2013.3.1-1: Comparative Effectiveness Research (CER) in health systems and health services interventions; HEALTH.2013.3.3-1: Social innovation for health promotion.

²¹ National Institutes of Health of the US Department of Health and Human Services

under the FP7-HEALTH-2013-INNOVATION-2 call where the maximum project duration is limited to 3 years. Similarly, the size of the EU contribution to the budget shall also be in line with the needs of the respective consortium, within the maximum EU contribution but not necessarily at the maximum by default.

- **Support for clinical trials will be continued:** This gives the opportunity to test the effectiveness of therapies for traumatic brain injury through a large-scale trial, cancer therapies, and palliative care, adapting off-patent medicines for paediatric or elderly use. This initiative addresses one of the most costly and time consuming steps in drug development which, if not realised, can block innovation from basic research to marketable products for the ultimate benefit of the patients.

Innovative clinical trials²² to verify safety and efficacy: The early involvement of patients²³ and their advocacy groups in the planning, implementation, and monitoring of a clinical trial are considered important so that patients' needs are appropriately considered. This may also increase the rate of enrolment of trial participants and can have a positive effect on the performance of the clinical trial. All studies shall carefully consider any relevant national and supra-national ethical and regulatory framework in force at European and national level for the conduct of clinical trials. Specific guidance on important information to be included in proposals involving clinical trials as well as specific information on the financing of clinical trials under FP7 rules can be found on the call page and in the guide for applicants.

- **Ethical issues:** It is particularly important that applicants address the potential ethical issues of their proposals, both in the proposed methodology and the possible implications of the results. The specific requirements for addressing ethical issues²⁴ are described in the Guide for Applicants (Annex 4, section 4). The differences of gender or sex in research (risk factors, biological mechanisms, causes, clinical features, consequences and treatment of diseases and disorders) will be considered where appropriate.
- **Use of animals in research:** Research activities should take into account the Protocol on the Protection and Welfare of Animals, and the use of animals in research and testing²⁵. The principle of the three Rs (reduction, refinement and replacement) should be applied where appropriate in research funded by the EU.
- **Gender dimension:** The pursuit of scientific knowledge and its technical application towards society requires the talent, perspectives and insight that may only be assured by increasing diversity in the research workforce. Therefore, all projects are encouraged to have a balanced participation of women and men in their research activities and to raise awareness on combating gender prejudices and stereotypes. When human beings are involved as users, gender differences may exist. These will be addressed as an integral part of the research to ensure the highest level of scientific quality. In addition, specific actions to promote gender equality in research may be financed as part of the proposal, as specified in Appendix 7 of the Negotiation Guidance Notes²⁶.

²² http://ec.europa.eu/health/human-use/clinical-trials/index_en.htm

²³ <http://www.eu-patient.eu/Initatives-Policy/Projects/ValuePlus/>

²⁴ http://cordis.europa.eu/fp7/ethics_en.html

²⁵ Para (30): http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_412/l_41220061230en00010041.pdf.

²⁶ ftp://ftp.cordis.europa.eu/pub/fp7/docs/negotiation_en.pdf

- ***Socio-economic dimension of research:*** Where relevant, account should be taken of possible socio-economic impacts of research, including its intended and unintended consequences and the inherent risks and opportunities. A sound understanding of this issue should be demonstrated both at the level of research design and research management. In this context, where appropriate, research actions and coordination and support actions should ensure engagement of relevant stakeholders (e.g. patients' organisations, civil society organisations, policy-makers, user groups) as well as cultivate a multi-disciplinary approach (including, where relevant, researchers from social sciences and humanities) and social innovation. Projects raising ethical or security concerns are also encouraged to pay attention to wider public outreach.
- ***Funding schemes:*** The work programme 2013 is implemented through a range of funding schemes. The types of the grants to be used for the various funding schemes are described in section III and the Guides for Applicants. For each funding scheme there are upper limits on the requested EU contribution (see topic descriptions in section II and conditions in section III for details). **It is important to note that funding limits will be applied as eligibility criteria. As a consequence, proposals that do not respect the corresponding limit will be considered ineligible. The same is valid for the limitation of the project duration for some of the topics.**
- ***Statistics in health research:*** Appropriate study design, data processing and statistical analysis of results are important for the quality and efficiency of the science and reliability of conclusions, and hence also ethically. Therefore, whenever applicable, the proposal will include and explain the statistical aspects. This may, for example, include description of the experimental plan and data gathering, method for uncertainty or measurement error estimation, statistical analysis of data and methods of inference (e.g. statistical tests and p-values to be used, accounting for multiple comparisons or small sample size, dealing with missing or noisy data), statistical power analysis and estimate (justification) of the number of needed animals or human subjects. If these are not applicable or not justified, the proposal will explain why.

II PROPOSED CONTENT FOR CALLS 2013

0. HORIZONTAL TOPICS FOR COLLABORATIVE PROJECTS RELEVANT FOR THE WHOLE OF THEME HEALTH

This activity aims at supporting innovation through the exploitation and dissemination of results from FP funded projects and their transfer into innovative applications and policies.

Note: For the topic listed below, applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.0-1: Boosting the translation of health research projects' results into innovative applications for health. FP7-HEALTH-2013-INNOVATION-2. The main aim of this topic is to allow SMEs to take up health research outcomes resulting from earlier FP funding under FP7 Theme Health and FP6 “Life sciences, genomics and biotechnology for health”, to prove the viability of methodologies, processes, prototypes, models, technologies, clinical trials, etc. developed under these projects, with a potential for application. However, the consortium does not need to be the same as in the previously funded project, but include participants as appropriate to exploit those particular results in the most logic and efficacious manner. Research activities under this topic will focus on testing and validation of results in order to reach the final development stage before products or processes enter into production, reach the market and/or patients. Proposals will fit into the overall business and innovation needs of the partners involved and will demonstrate clear exploitation potential and socio-economic benefits for the patients, for them and the society at large. Applicants should have the freedom to exploit the results for commercial use. Applicants will describe clearly and convincingly how the results, knowledge and/or technology will be brought forward enough to reach the stage of application.

Note: Limits on the EU financial contribution and project duration will apply and will be implemented strictly as eligibility criteria.

Funding scheme: Collaborative Project (small or medium-scale focused research project)

One or more proposals may be selected.

Expected impact: Translation of high level scientific knowledge into applications and innovative products and services. Considering the specificities of the economic sectors falling under this activity of Theme Health, projects funded under this topic are expected to pave the way from the development of scientific knowledge and technologies to the market by stimulating the development of new products, tools, technologies, patents, dedicated business path and innovative marketable applications.

Specific requirements to be considered under the evaluation:

- Specific innovation initiative designed to encourage strong SME efforts towards the translation of research results into innovative applications for health.
- Leading role of SMEs in the project (see also section III, p.65 of this document).

- Developing a short business plan clearly describing the valorisation of the technology(ies) when presenting a full proposal for stage 2.
- Expected outcomes being of clear interest and potential benefit to SME(s).

Additional eligibility criteria:

1. The **requested EU contribution** per project will **depend on the needs of the project indicated in the proposal but shall not** exceed EUR 6 000 000.

2. The proposed **project duration** indicated in the proposal shall **not exceed 3 years**.

3. The **financial viability of all partners** in projects shall fulfil the Commission applicable rules²⁷. This will be checked at negotiation stage before the signature of the grant agreement.

4. **Number of participants:** minimum 3 established in at least three different EU Member States or Associated Countries with the specific condition for SMEs under point 6 below. The maximum number of participants is 5.

5. The **estimated EU contribution going to SMEs** shall **be 50% or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

6. **Participation of SMEs or SME joint ventures is restricted** to entities established in EU Member States and Associated Countries. In addition, SMEs shall fulfil any of the following conditions: 1) be at least 51% owned and controlled by one or more individuals who are citizens of one of the EU Member States or Associated Countries or permanent residents in one of those countries, or 2) be at least 51% owned and controlled by another business that is itself at least 51% owned and controlled by individuals who are citizens of, or permanent residents in those countries.

1. BIOTECHNOLOGY, GENERIC TOOLS AND MEDICAL TECHNOLOGIES FOR HUMAN HEALTH

This activity aims at developing and validating the necessary tools and technologies that will enable the production of new knowledge and its translation into practical applications in the area of health and medicine.

1.1 HIGH-THROUGHPUT RESEARCH

Closed 2013

1.2 DETECTION, DIAGNOSIS AND MONITORING

The objectives are to develop visualisation, imaging, detection and analytical tools and technologies for biomedical research, for prediction, diagnosis, monitoring and prognosis of diseases, and for support and guidance of therapeutic interventions. The focus will be on a

²⁷ ftp://ftp.cordis.europa.eu/pub/fp7/docs/rules-verif_en.pdf

multidisciplinary approach integrating areas such as: molecular and cellular biology, physiology, genetics, physics, chemistry, biomedical engineering, micro-systems, devices and information technologies. Non- or minimally invasive and quantitative methods and quality assurance aspects will be emphasised. For this call for proposals, the focus will be on the development of imaging technologies for guiding therapeutic interventions for personalised medicine applications.

Note: For the topic listed below, applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.1.2-1: Development of imaging technologies for therapeutic interventions in rare diseases. FP7-HEALTH-2013-INNOVATION-1. The aim is to support development and/or proof of principle of new or improved combined imaging technologies for therapeutic interventions in rare diseases. Two or more techniques, of which at least one should be molecular imaging, should be integrated into a complete simultaneous system for application in one or more rare diseases in the frame of personalised medicine, *i.e.* tailored medical interventions which are more effective and/or have fewer undesirable adverse effects in specific patients. The technologies should be of use as biomarkers during the therapeutic interventions. Clinicians should actively be included in the project.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: SME-targeted Collaborative Project (small or medium-scale focused research project)

One or more proposals may be selected.

Expected impact: The development of new and improved technologies for therapeutic interventions in groups or categories of rare diseases, facilitating the uptake of personalised medicine into clinical practice and support the competitiveness of Europe in this area. The applications are expected to advance research in personalised medicine and have an impact in the relevant industry (in particular for SMEs). The projects will contribute to the International Rare Diseases Research Consortium (IRDiRC)²⁸.

Specific requirements to be considered under the evaluation:

- SME-targeted research is designed to encourage SME efforts towards research and innovation.
- Leading role of research intensive SMEs.
- Leading role of SMEs with R&D capacities, but the coordinator does not need to be an SME.
- Expected outcomes being of clear interest and potential benefit to SMEs.

Additional eligibility criteria:

1. The **requested EU contribution per project** shall not exceed EUR 6 000 000.
2. The **estimated EU contribution going to SMEs shall be 30% or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial

²⁸ <http://www.e-rare.eu/content/irdirc>

viability will be assessed at the end of the negotiation, before signature of the grant agreement.

1.3 SUITABILITY, SAFETY, EFFICACY OF THERAPIES

The development of novel therapeutics, vaccines or biomedical tools and devices is often severely impeded by safety and efficacy issues that should exhaustively be addressed already at an early stage of product development. The focus of this call is therefore to efficiently address aspects of toxicology, adverse immune reactions, reduced potency and impaired efficacy of novel medical products in a broad way, encouraging the employment of novel approaches including modelling efforts, novel tests, assays and preclinical models as well as focused human studies, that help to assess earlier, better and more cost-efficiently safety and efficacy aspects of medical interventions and devices. Predictive toxicology and efficacy assessment should be validated by appropriate human studies.

Note: For all topics in this area applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.1.3-1: Modelling toxic responses in case studies for predictive human safety assessment. FP7-HEALTH-2013-INNOVATION-1. The main objective of this topic is to exploit in case studies recent advances in computational chemistry and systems biology in order to provide the basis for innovative approaches to predictive human safety assessments. Integrated research should be undertaken that:

- Considers modelling transport and interactions from molecular to cellular/organelle levels;
- Integrates with *in vitro* experimentation designed specifically to inform this modelling activity;
- Couples directly to systems modelling from cellular to organ level;
- Takes account of mechanistic understandings of toxic responses in specific organs; and
- Uses existing and appropriate infrastructure for computation data basing and sharing.

Besides the development of a comprehensive strategy and research concept, the following issues should be addressed either at the theoretical or at the experimental level:

- Identifications of metabolites (and metabolites of metabolites) and their reactivity, through a combination of computational chemistry, *in vitro* experimentation and enzyme expression profiling.
- Identification of the proteins and potentially other intracellular targets, affected by each metabolite, through computational chemistry and *in vitro* work.
- Identification of the pathways affected by these proteins, through *in vitro* cell assays and systems biology.
- Identification of cell functions affected by these pathways, by defining the boundaries of normal function, and understanding of the physiology and systems biology.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding schemes: Collaborative Project (large-scale integrating project)

Only up to one proposal may be selected.

Expected Impact: It is expected that a truly integrated approach where modellers, chemists and biologists will define and engage jointly on integrated research with shared goals and will provide a platform for exploring innovative approaches to a better human safety assessment. It should be built on current attempts around the world that model specific organs. It should go beyond these to deliver an approach which is fit-for-purpose for predictive toxicology.

Additional eligibility criteria:

1. The **requested EU contribution per project** shall not exceed EUR 12 000 000.
2. The **estimated EU contribution going to *industry including SMEs shall be 15% or more*** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

HEALTH.2013.1.3-2: Innovative approaches to address adverse immune reactions to biomedical devices, implants and transplant tissues. FP7-HEALTH-2013-INNOVATION-1. Administration of biomedical devices, implants or tissue transplants can cause severe and often chronic, adverse reactions of the human immune system. Projects will aim to identify adverse immune reactions caused by such devices or tissues using systems immunological studies and other innovative approaches, and develop remedial strategies. Research consortia will be multidisciplinary, bringing together basic immunology, epidemiological and clinical expertise, with systems and cellular biology know-how and a thorough understanding of product development and regulatory issues. A strong participation of key players from industry and the clinical field is essential.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding schemes: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: A better holistic understanding of adverse immune reactions should allow the better design of medical devices and materials for implants, and improve outcome of tissue transplantation. Development of novel therapeutic or preventive strategies to combat adverse immune reactions.

Additional eligibility criteria:

1. The **requested EU contribution per project** shall not exceed EUR 6 000 000.
2. The **estimated EU contribution going to *industry including SMEs shall be 30% or more*** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

HEALTH.2013.1.3-3: Safety and efficacy of therapeutic vaccines. FP7-HEALTH-2013-INNOVATION-1. The aim is to advance promising new therapeutic vaccines into clinical safety and efficacy testing. Chronic infectious diseases (including infections in immunocompromised patients), inflammatory and autoimmune diseases, allergies, degenerative, and metabolic diseases as well as vaccines against drug addictions, may be addressed. Excluded are cancer vaccines addressed in area 2.4.1-1. The suggested therapy

should be based on an active vaccination effect triggering a human immune response hence bearing particular innovation potential. Projects should focus on therapeutic vaccines for which efficacy has been demonstrated in preclinical work, *e.g.* in appropriate animal models. Projects will demonstrate that a therapeutic vaccine in the envisaged area is superior to existing or competing therapies under development, and that the expected cost-medical benefits ratio meets public health needs. Consortia should be strongly product-focused and should comprise only an essential number of contributing partners. Consortia will include industry, especially from the SME sector from EU Member States and/or Associated Countries.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: Promising therapeutic vaccine candidates should be further advanced in the development phase with a clear proof of concept for safety and efficiency, thus widely and profoundly boosting the field of vaccine R&D in Europe.

Additional eligibility criteria:

1. The **requested EU contribution** per project shall not exceed EUR 6 000 000.
2. The **estimated EU contribution going to industry including SMEs shall be 30 % or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

HEALTH.2013.1.3-4: Development of alternative *in vitro*, analytical, immunochemical, and other test methods for quality control of vaccines. FP7-HEALTH-2013-INNOVATION-1. Novel technological approaches are needed to ensure faster and more reliable testing of vaccine products. While upholding full compliance with the regulatory requirements that govern the development and production of vaccine products, research activities will be directed at exploring to which extent animal-based safety and potency testing of experimental or licensed vaccines can be replaced (in totality or partially) by alternative *in vitro*, analytical, immunochemical or other (*e.g.* molecular) tests or processes. Support is therefore given to studies aiming to develop and validate novel, rapid and reliable safety and potency assays that demonstrate correlation of safety of vaccine products with animal-tested batches. Research consortia should be led by regulatory bodies or industry, including SME participants, familiar with all aspects of the development and the production of vaccines for use in humans. To fully exploit potentially synergistic expertise from the field of animal vaccines, key players from the field of veterinary vaccines can be useful partners in research consortia to be formed. Preference will be given to projects not exceeding three years project duration.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding schemes: Collaborative Project (small-scale focused research project).

One or more proposals may be selected.

Expected impact: An EU-supported research effort for the development of *in vitro* potency tests for vaccines closely coordinated with industry and regulatory bodies will complement

existing efforts, and should prove the potential of new tests to reduce, refine and replace animals in vaccine research.

Additional eligibility criteria:

1. The **requested EU contribution per project** shall not exceed EUR 3 000 000.
3. The **estimated EU contribution going to industry including SMEs shall be 30% or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

1.4 INNOVATIVE THERAPEUTIC APPROACHES AND INTERVENTIONS

The focus of this year's topic is human stem cell research. Stem cells offer great promise for therapy but practical applications are still limited. This topic focuses on the key area of differentiation, proliferation and biological activity/potency where further knowledge of mechanisms of action, development of cell technology and fulfilment of regulatory standards are required²⁹.

Note: For all topics in this area applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.1.4-1. Controlling differentiation and proliferation in human stem cells intended for therapeutic use. FP7-HEALTH-2013-INNOVATION-1. The aim of this topic is to develop the application of stem cells and reprogrammed cells towards new therapies. Projects should be developed around a concept based on the use of human stem cells, reprogrammed cells and/or differentiated cells derived from them to address an identified and justified therapeutic objective. Specifically, projects should focus on control of self-renewal, differentiation and proliferation, *in vitro* and/or *in vivo*, and assessment of the biological activity/potency of the therapeutic effect. Proposals should not make cancer a target since this is covered in another part of the work programme. Applications using haematopoietic stem cells and their lineages are excluded. Projects may include pre-clinical and clinical testing as appropriate. Preference will be given to projects involving the use of advanced research tools and *in vivo* investigations. Consortia will include industry, especially from the SME sector from EU Member States and/or Associated Countries.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: Creation of new knowledge or development of new techniques controlling differentiation and proliferation of human stem cells and reprogrammed cells for therapeutic purpose that can progress the translation of this research to the clinic.

Additional eligibility criteria:

²⁹ See *Reflection Paper on Stem Cell-based Medicinal Products adopted by the European Medicine Agency's Committee for Advanced Therapies (EMA/CAT/571134/2009) on 14 January 2011*, available at:

www.ema.europa.eu/docs/en_GB/document_library/Scientific_guideline/2011/02/WC500101692.pdf

1. The **requested EU contribution per project** shall not exceed EUR 6 000 000.
2. The **estimated EU contribution going to SMEs shall be 15 % or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

2. TRANSLATING RESEARCH FOR HUMAN HEALTH

This activity aims at increasing knowledge of biological processes and mechanisms involved in normal health and in specific disease situations, to transpose this knowledge into clinical applications including disease control and treatment, and to ensure that clinical (including epidemiological) data guide further research.

2.1 INTEGRATING BIOLOGICAL DATA AND PROCESSES: LARGE-SCALE DATA GATHERING, SYSTEMS BIOLOGY

2.1.1 Large-scale data gathering

The objective of this area is to use high-throughput technologies to generate data for elucidating the function of genes and gene products in biological processes.

In the post-genome era the omics technologies (genomics, proteomics, structural biology, epigenomics, interactomics, metabolomics, pharmacogenomics, etc.) enable new innovative approaches in diagnosis, drug development, and individualised therapy. The selected projects will set up the necessary data resource and technological platforms for developing novel approaches for diagnostic and treatment of diseases, including rare diseases.

The integration of data-dense information from the different omics platforms at the individual and population levels is an essential step to reap the benefits of omics technologies for healthcare.

For this call for proposals, topics focus on model systems and on the human microbiome. The first topic aims at the development of validated animal and cellular model systems to support the development of new predictive, preventive or therapeutic approaches, whereas the second topic aims at facilitating better prediction, prevention, treatment and cure of diseases on the basis of microbial characteristics of individual patients.

Note: For all topics in this area applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.2.1.1-1: Functional validation in animal and cellular models of genetic determinants of diseases and ageing processes. FP7-HEALTH-2013-INNOVATION-1. The project should use various animal and cellular models to discover and ascribe functions of genes known to be associated to human diseases and/or ageing processes. It will aim at

better understanding of the disease and ageing processes in view of creating a portfolio of new and validated therapeutic targets. This project should include large-scale metabolic and molecular phenotyping in model organisms and *in vitro* model systems (including human embryonic (hES) or induced pluripotent (iPS) stem cells) with priority given to the genes shown to be associated to human disease and/or involved in ageing. It could include work with human hES or iPS cells developed from patients where applicable. It should envisage generating models with the intention to investigate diseases variations in relation with different mutated human alleles. It should develop efficient, standardised and reliable tools, common ontology, standardised operating procedures and technologies for phenotyping. Data will be integrated and maintained in publically accessible web portals.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: SME-targeted Collaborative Project (large-scale integrating research project).

One or more proposals may be selected.

Expected impact: Validated animal and cellular models that can be used in the development of predictive measures, or in the development of preventive measures, or for new therapies for the selected diseases. Validated tools with the potential for clinical translation.

Specific requirements to be considered under the evaluation:

- SME-targeted research is designed to encourage SME efforts towards research and innovation.
- Leading role of research intensive SMEs.
- Leading role of SMEs with R&D capacities, but the coordinator does not need to be an SME.
- Expected outcomes being of clear interest and potential benefit to SMEs.

Additional eligibility criteria:

1. The **requested EU contribution per project** shall not exceed EUR 12 000 000.
2. The **estimated EU contribution going to SMEs shall be 30% or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

HEALTH.2013.2.1.1-2: High impact research initiative on metagenomics for personalised medicine approaches. FP7-HEALTH-2013-INNOVATION-1. This project will build on recent very promising research results on the composition of the human microbiome that highlighted the diagnostic potential and possible stratification of patients. The project should accelerate and promote research on the role of the human microbiome in health, diseases and ageing. Through metagenome profiling in large patient cohorts, the project should study the link between the micro flora composition and diseases. This multi-component project should be highly effective also through the involvement of a wider range of partners. It should contribute to the International Human Microbiome Consortium (IHMC)³⁰ and should include:

³⁰ <http://www.human-microbiome.org/>

- **Metagenome profiling in health, diseases and ageing.** This component should investigate the composition of the human microbiome in different population cohorts with the intention to generate knowledge of functional composition of microbiomes within the human population. Profiling should also be done to find associations between microbiome and health or diseases in particular host/microbe interactions and immune system responses. The relevance of the frequency and stability of identified microbiomes should be determined. The potential role of the human microbiome in autoimmune and inflammatory diseases should be investigated as well as the correlation between microbial symbiotic states and the immune system in health and in autoimmune and inflammatory diseases. Based on comparative metagenomics profiling the new interventions for improved disease management should be developed.
- **Investigations of the potential role of the metagenome on drug response (drug absorption and metabolism).** This component should investigate the correlation between microbial symbiotic states and responses to medicinal products. Based on comparative metagenomics profiling the project should also develop new interventions that would modify the microbiome to improve response to drug treatment. This should also include interventions aiming to restore the microbiome following e.g. long antibiotic treatment, disruptive conditions, etc.
- **Development of new metagenome-based diagnostic and prognostic tools for personalised treatments.** This component will explore the potential of using human microbiome characteristics as predictive, diagnostic or preventive tools for disease.
- **Bioinformatics tools.** The project should establish means to collect, organise and annotate information and to deliver results in conformity with IHMC policies.
- **Cross boundary training and exchange programmes.** The project should facilitate the transfer of technologies and knowledge between the disciplines from basic research to the clinic, through cross boundary training and exchange programmes. It should allow for synergies between the different research disciplines in a better way than if these disciplines would be funded as separate projects.

The project will aim at developing metagenomics by further generating the technology, knowledge and know-how in this research area. It should increase Europe's competitive position in exploiting the vast amount of metagenomic data and related information. The project should encourage SME efforts towards research and innovation. Priority will be given to proposals demonstrating that industry is playing an important role. The expected project results should clearly be of interest and potential benefit to SMEs.

The funded project should enhance the EU contribution to the International Human Microbiome Consortium. A complimentary topic (KBBE.2013.2.2-02: Factors influencing the human gut microbiome and its effect on the development of diet related diseases and brain development) is being published in the FP7 Food, Agriculture, Fisheries and Biotechnology (KBBE) work programme 2013. During the negotiations, if collaboration between the selected projects can be demonstrated to offer added value, the interconnections and interfaces between these projects but also with other projects in the field will be discussed in order to optimise the cooperation between the projects selected and to ensure maximum synergies.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (large-scale integrating project).

Only up to one proposal may be selected.

Expected impact: Better knowledge of the human microbiome and its potential roles in health and disease. This identification of person-specific microbiomes and microbial markers should allow stratification and attribution of patients to different individual health situations or physical conditions. The project will address health care challenges by facilitating better prediction, prevention, treatment and cure of diseases on the basis of microbial characteristics of individual patients. It aims to foster innovation and strengthening the competitive position of the European health care industry (from EU Member States and Associated Countries). It should create a high impact also through the involvement of a wide range of partners.

Additional eligibility criteria:

1. The **requested EU contribution per project** shall not exceed EUR 30 000 000.
2. The **estimated EU contribution going to industry including SMEs shall be 30% or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

2.1.2 Systems biology

Closed 2013

2.2 RESEARCH ON THE BRAIN AND RELATED DISEASES, HUMAN DEVELOPMENT AND AGEING

2.2.1 Brain and brain-related diseases

The objectives of this area are to better understand the integrated structure and dynamics of the brain, and to study brain diseases including relevant age related illness and search for new therapies. The overall aim is to gain a global understanding of the brain by exploring brain functions, from molecules to cognition including neuroinformatics, and brain dysfunction, from synaptic impairment to neurodegeneration. Research will address neurological and psychiatric diseases and disorders, including regenerative and restorative therapeutic approaches.

For this call for proposals, research in this area will focus in particular on mental health, neurological disorder (epilepsy), pain, and on the implementation of a programme level cooperation with US and Canada on traumatic brain injury. Those priorities are in line with the effort on paediatric brain diseases started in 2011, with the European Pact for Mental Health and with the International Initiative for Traumatic Brain Injury Research (InTBIR)³¹ that is being set up in cooperation with the US (NIH) and Canada.

Note: For all topics in this area applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

³¹ http://ec.europa/ipv4.eu/research/health/medical-research/brain-research/international-initiative_en.html

HEALTH.2013.2.2.1-1: Prospective longitudinal data collection and Comparative Effectiveness Research (CER) for traumatic brain injury (TBI). FP7-HEALTH-2013-INNOVATION-1. The present topic asks for a prospective, longitudinal, non-randomised clinical study on a cohort of minimum 5 000 TBI patients over 5 years or longer, with a view to better characterise TBI in Europe and identify the most effective clinical interventions (both acute and post-acute) to treat TBI. Applicants are asked to collect a set of TBI Common Data Elements (TBI-CDEs)³², the data standards endorsed by the International Initiative for Traumatic Brain Injury Research (InTBIR). Applicants will collect all relevant core TBI-CDEs. Compliance with this requirement will be taken into consideration during evaluation. The collection of supplemental/emerging CDEs and/or other clinical data in addition to the core CDEs is encouraged. Additional project components will focus on:

- Establishing an open-source database for easy storage and analysis of the collected data. The database should be compatible with the US FITBIR database³³. Where applicable, the integration with other existing databases and biobanks should be achieved.
- Applying CER analysis to the collected data to identify the most effective treatment according to patient history and type of injury.
- Development and dissemination of treatment recommendations based on the results of the CER analysis to provide evidence for future international clinical guidelines.
- Communication and networking activities (conferences, website, brochures, InTBIR meetings, etc.) to exchange information, data and best practices with other InTBIR projects funded by other agencies (NIH³⁴ and CIHR³⁵) and the scientific community at large.

The management structure and provisions need to be adequate to the size and scope of the project.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (large-scale integrating project).

One or more proposals may be selected.

Expected impact: The funded project is expected to contribute towards the goals of the International Initiative for Traumatic Brain Injury Research (InTBIR)³⁶. In particular, the project is expected to identify the most effective clinical interventions taking into consideration the type of brain injury and the history of the patient, and to contribute to the development of improved and harmonised clinical guidelines for the treatment of TBI.

Additional eligibility criterion:

The **requested contribution** per project shall not exceed EUR 30 000 000.

³² The TBI-CDE, listed by category, can be found at <http://www.commondataelements.ninds.nih.gov/TBI.aspx>

³³ <http://fitbir.nih.gov/tbi-portal/jsp/about/index.jsp>

³⁴ National Institutes of Health of the US Department of Health and Human Services

³⁵ Canadian Institutes of Health Research

³⁶ http://ec.europaipv4.eu/research/health/medical-research/brain-research/international-initiative_en.html

HEALTH.2013.2.2.1-2: Development of effective imaging tools for diagnosis, monitoring and management of mental disorders³⁷. FP7-HEALTH-2013-INNOVATION-1. This topic invites researchers, industry and SMEs to develop new or optimise existing imaging technologies, and validate their application to mental disorders by integrating imaging data with complementary knowledge resulting from e.g. genomics, biomarkers, bioinformatics and clinical data. The goal is to allow the diagnosis of mental disorders at the pre-symptomatic stage or early during development, more accurate patient stratification and better measurement of disease progression.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: This topic is expected to develop new or optimise existing imaging technology for the benefit of patients with psychiatric disorders. It will also encourage SME participation and foster innovation in Europe in line with the Europe2020 agenda. In addition, it will support the goals of the European Pact for Mental Health³⁸.

Additional eligibility criteria:

1. The **requested EU contribution** per project shall not exceed EUR 6 000 000.
2. The **estimated EU contribution going to industry including SMEs shall be 30% or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

HEALTH.2013.2.2.1-3: Paediatric conduct disorders characterised by aggressive traits and/or social impairment: from preclinical research to treatment. FP7-HEALTH-2013-INNOVATION-1. This topic aims at gaining new insights into the mechanisms underlying pathological aggression as well as developing preventative and therapeutic strategies for paediatric (0-18 years) conduct disorders characterised by aggressive and impulsive traits and/or social impairment. Applicants should apply a multidisciplinary approach to translate pre-clinical findings to therapies for the benefit of patients. Research proposed may address key issues such as genomics and genes/environment interactions, neurobiology of aggression and violence, identification of predictors of persistence and/or remission of symptoms in adulthood, development of strategies to prevent and treat these disorders and/or enhance remission.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: To improve the understanding of the neurobiology of paediatric conduct disorders characterised by aggressive traits and/or social impairment and the development of

³⁷ As defined in the Diagnostic and Statistical Manual of Mental Disorders, 4th edition.

³⁸ http://ec.europa.eu/health/ph_determinants/life_style/mental/docs/pact_en.pdf

new psychological and pharmacological interventions for prevention and treatment of these disorders.

Additional eligibility criteria:

1. The **requested EU contribution** per project shall not exceed EUR 6 000 000.
2. The **estimated EU contribution going to SME(s) shall be 15% or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

HEALTH.2013.2.2.1-4: Patho-physiology and therapy of epilepsy and epileptiform disorders. FP7-HEALTH-2013-INNOVATION-1. Applicants are expected to use multidisciplinary strategies in support of basic, preclinical and/or clinical research on epilepsy and epileptiform disorders. The goal is to better understand the complex patho-physiology of epilepsy in order to develop novel preventative strategies in at-risk patients, improve diagnostic methods, achieve better patient stratification and develop more effective therapeutics. Research proposed may address key issues such as genomics of epilepsy and epileptiform disorders, mechanisms of ictogenesis and epileptogenesis, prevention of the development of epilepsy after potentially epileptogenic brain insults, mechanisms and/or epidemiology of refractory epilepsy, identification of age- and aetiology-specific drug targets for input in drug discovery process.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (large-scale integrating project).

One or more proposals may be selected.

Expected impact: This theme is expected to improve our understanding of the aetiology and mechanisms of epilepsy and epileptiform disorders. It will also help preventing the development of the disease after potentially epileptogenic brain insults. The presence of SMEs will help translating the molecular and cellular targets identified in basic and clinical research into a rational drug discovery process.

Additional eligibility criteria:

1. The **requested EU contribution** per project shall not exceed EUR 12 000 000.
2. The **estimated EU contribution going to SME(s) shall be 15% or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

HEALTH.2013.2.2.1-5: Understanding and controlling pain. FP7-HEALTH-2013-INNOVATION-1. This topic targets pain syndromes whose treatments are inexistent or inadequate, such as headache and migraine, neurogenic and neuropathic pain. Further studies are needed to gain knowledge on the mechanisms of different pain syndromes as well as the significant inter-individual variation in the response to painful stimuli and analgesic drugs. The goal is to identify and develop biomarkers for pain to enable better patient stratification, mechanism-based treatment selection and targeted prevention strategies for high-risk individuals. Research proposed may address bottlenecks such as: pain predisposing genetic

polymorphisms, circuitries and processes modulating nociception and endogenous analgesia, understanding the cognitive, emotional and behavioural components of pain, and new druggable molecular targets.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: Successful projects are expected to deepen our knowledge of how pain is generated, propagated and quenched, work towards the identification of more effective diagnostic and/or treatment approaches, and help translate pre-clinical and clinical results into solutions for the benefit of the patients.

Additional eligibility criterion:

The **requested EU contribution** per project shall not exceed EUR 6 000 000.

2.2.2 Human development and ageing

Closed 2013

2.3 TRANSLATIONAL RESEARCH IN MAJOR INFECTIOUS DISEASES: TO CONFRONT MAJOR THREATS TO PUBLIC HEALTH

The aim of this area is to confront major threats to public health with emphasis on HIV/AIDS, malaria, tuberculosis, hepatitis, neglected infectious diseases, emerging epidemics and anti-microbial drug resistance, including fungal pathogens.

2.3.0 Cross-cutting priorities

This section comprises broad research topics that address two or more of the disease-oriented sub-areas under area 2.3.

Note: For all topics in this area applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.2.3.0-1: Innovation in vaccines. FP7-HEALTH-2013-INNOVATION-1.

This topic supports the pre-clinical and clinical development of new, innovative, safe and effective vaccines. Proposals will focus on:

- 1) Towards "universal" influenza vaccines, providing longer-lasting and broader protection against multiple strains of influenza virus, with the ultimate aim of efficiently protecting the general population from seasonal and pandemic influenza, or
- 2) Prophylactic vaccines for any of the neglected infectious diseases. Research will be sufficiently advanced to initiate human clinical testing during early phases of the project. For the purpose of this call topic, neglected infectious diseases include

kinetoplastid diseases (sleeping sickness, leishmaniasis, Chagas disease); neglected bacterial diseases (trachoma); viral (rabies) or helminth diseases [lymphatic filariasis, cysticercosis, or soil-transmitted nematodes (Ascariasis, Trichuriasis, Hookworm)].

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: SME-targeted Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: The project is expected to engage research intensive SMEs into the development of new, safe and efficacious vaccines with a real potential to contribute significantly to human health.

Specific requirements to be considered under the evaluation:

- SME-targeted research is designed to encourage SME efforts towards research and innovation.
- Leading role of research intensive SMEs.
- Leading role of SMEs with R&D capacities, but the coordinator does not need to be an SME.
- Expected outcomes being of clear interest and potential benefit to SMEs.

Additional eligibility criteria:

1. The **requested EU contribution** per project will depend on the needs of the project indicated in the proposal but shall not exceed EUR 6 000 000.
2. The **estimated EU contribution going to SMEs shall be 30% or more** of the total estimated EU contribution to the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

2.3.1 Anti-microbial drug resistance

The strategic objective of this area is to confront the increasing emergence and spread of antimicrobial drug resistant (AMR) pathogens in a multi-disciplinary approach through the development of effective infection prevention, treatment and control strategies.

The Commission recently launched its action plan against the rising threats from antimicrobial resistance³⁹. A package of call topics for proposals supporting the aims of this Action plan through reinforcing and coordinating research and innovation can be found in three FP7 Cooperation Work Programmes, Health-2013 (HEALTH.2013.2.3.1-1, HEALTH.2013.2.3.1-2 and HEALTH.2013.3.1-1), KBBE-2013 (KBBE.2013.1.3-05) and NMP-2013 (NMP.2013.1.2-2).

Note: For all topics in this area applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

³⁹ Commission Communication' Action plan against the rising threats from Antimicrobial resistance' COM(2011)748

HEALTH.2013.2.3.1-1: Drugs and vaccines for infections that have developed or are at risk of developing significant anti-microbial resistance. FP7-HEALTH-2013-INNOVATION-2. Projects should aim to develop novel, safe and efficacious antimicrobials,

vaccines or alternative medical approaches to treat infections that have developed or are at the risk of developing significant anti-microbial resistance. Projects may include different components of the development pipeline from discovery phase to clinical trials.

Note: Limits on the EU financial contribution and project duration will apply and will be implemented strictly as eligibility criteria.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: The research is expected to stimulate a better integration of research and development activities between different players and boost the development of novel antimicrobials or vaccines against pathogens for which there is limited treatment options due to drug resistance. Research projects funded here are expected to be complementary to any possible upcoming activities undertaken in the context of IMI in relation to antimicrobial resistance.

Specific requirements to be considered under the evaluation:

- Specific innovation initiative designed to encourage strong SME efforts towards the translation of research results into innovative applications for health.
- Leading role of SMEs in the project (see also section III, p.65 of this document).
- Developing a short business plan clearly describing the valorisation of the technology(ies) when presenting a full proposal for stage 2.
- Expected outcomes being of clear interest and potential benefit to SMEs.

Additional eligibility criteria:

1. The **requested EU contribution** per project will depend on the needs of the project indicated in the proposal but shall not exceed EUR 6 000 000.
2. The proposed **project duration** indicated in the proposal **may not exceed 3 years**.
3. The **financial viability of all partners** in projects shall fulfil the Commission applicable rules⁴⁰. This will be checked at negotiation stage before signature of the grant agreement.
4. **Number of participants:** minimum 3 established in at least three different EU Member States or Associated Countries with the specific condition for SMEs under point 6 below. The maximum number of participants is 5.
5. The **estimated EU contribution going to SME(s)** shall **be 50% or more** of the total estimated EU contribution to the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.
6. **Participation of SMEs or SME joint ventures is restricted** to entities established in EU

⁴⁰ ftp://ftp.cordis.europa.eu/pub/fp7/docs/rules-verif_en.pdf

Member States and Associated Countries. In addition, SMEs shall fulfil any of the following conditions: 1) be at least 51% owned and controlled by one or more individuals who are citizens of one of the EU Member States or Associated Countries or permanent residents in one of those countries, or 2) be at least 51% owned and controlled by another business that is itself at least 51% owned and controlled by individuals who are citizens of, or permanent residents in those countries.

HEALTH.2013.2.3.1-2: Stratified approaches to antibacterial and/or antifungal treatment. FP7-HEALTH-2013-INNOVATION-1. In order to improve the use of antibacterials and antifungals (dosage, duration, indication and combinations) with regard to treatment effectiveness, reduction of adverse effects as well as emergence of drug resistance, antimicrobial administration needs to be better tailored to the actual needs of individual patients. Projects should aim to gain a better understanding of both pathogen and host factors, as well as their interaction, with the objective to allow for more stratified treatment options and improved antimicrobial administration. Where relevant, consideration should be given to gender aspects and ageing.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small or medium scale focused research project).

One or more proposals may be selected.

Expected impact: Enabling the prescription of antimicrobials specifically tailored to the needs of individual patients will decrease the use of unnecessary or ineffective antimicrobials, which ultimately in turn is expected to slow down the emergence of antimicrobial resistance.

Additional eligibility criterion:

The **requested EU contribution** per project shall not exceed EUR 6 000 000.

2.3.2 HIV/AIDS, malaria and tuberculosis

Closed 2013

2.3.3 Potentially new and re-emerging epidemics

The focus will be on confronting emerging pathogens with pandemic potential. The results of research in this area will integrate European scientific excellence and make Europe better prepared for emerging epidemics.

For this call for proposals, topics focus on building European preparedness to respond to emerging epidemics of any kind, including prions, viruses, bacteria and protozoans.

Note: For all topics in this area applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.2.3.3-1: Clinical management of patients in severe epidemics. FP7-HEALTH-2013-INNOVATION-1. The objective is to set up a multidisciplinary consortium

able to provide a rapid, harmonised and optimised approach to clinical management of patients in relation to any severe infectious outbreak with a pandemic potential or significant risk of major damage to health and socio-economics in the EU. The consortium will address severe acute respiratory infections, as well as other acute infections (e.g. hemorrhagic fevers, encephalopathy, severe diarrhoeas, etc.). It should build a standardised methodological approach (pre-approval of protocols and ethical issues, common definitions and databases, mechanisms to rapidly exchange high quality data and samples, etc.) that would ensure the readiness to immediately perform large-scale clinical studies in response to an emerging threat with the view of delivering harmonised and optimal clinical treatments to the affected patients in any location and helping controlling the outbreak. It also needs to have a solid "inter-epidemic" research plan, addressing issues such as, but not restricted to, multi-centre clinical trials, studies on pathogenesis, immunity and determinants of severity. It may also explore the feasibility of developing novel, rapid, reliable, sensitive, user-friendly, and affordable approaches for the detection and characterisation of pathogens in order to support patient treatment and outbreak control. Training activities should be elaborated to spread to clinical centres the new insights that should translate into optimal clinical management of patients in the context of severe epidemics. Special attention should be given to EU Member States and Associated Countries with limited capacity to respond to such epidemics. The consortium is expected to collaborate with other EU funded research projects where relevant and consult and collaborate with the European Centre for Disease Prevention and Control (ECDC) in order to improve the European preparedness and response to any emerging threat. The project should structure the European contribution towards international initiatives already existing or under development in this field.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (large-scale integrating project).

Only one proposal may be selected.

Expected impact: The research should provide technical and scientific support as well as standardised protocols/definitions/strategies for the optimal clinical management of patients in any severe infectious outbreak with pandemic potential or significant risk of major damage to health and socio-economics in the EU. It is expected to help designing a coherent, adequate and rapid public health response to emerging threats. The consortium should establish and foster links with national and international public health agencies to ensure the quick implementation of its findings into optimised clinical practices in the EU member states and other countries in the world.

Additional eligibility criterion:

The **requested EU contribution** per project shall not exceed EUR 24 000 000.

2.3.4 Neglected infectious diseases

The aim of this area is to establish an integrated approach for the development of preventive, therapeutic and diagnostic tools for neglected infectious diseases.

Note: For all topics in this area applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.2.3.4-1: Neglected infectious diseases of Central and Eastern Europe. FP7-HEALTH-2013-INNOVATION-1. This action will support innovative, collaborative biomedical research proposals that address neglected infectious diseases, which disproportionately affect Central and Eastern Europe (CEE)⁴¹. Research will focus on one or more of the following viral (tick-borne encephalitis, Congo-Crimean haemorrhagic fever, rabies), bacterial (borreliosis and other tick-borne bacterial diseases), protozoan (babesiosis, giardiasis), and/or helminthic (trichinellosis, taeniasis and human echinococcosis) human diseases. Proposals will provide an integrated, multidisciplinary approach with significant participation of partners from disease-endemic areas and, where relevant, industry partners. Proposals should include plans for translating research results into innovation in the health systems or through product development activities.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small-scale focused research project).

One or more proposals may be selected.

Expected impact: Projects are expected to deliver new knowledge about the biological mechanisms and pathology of neglected infectious diseases, which are disproportionately affecting CEE. This knowledge should be obtained and analysed in such a way that it can contribute to the future prevention, treatment or diagnosis of the disease(s) in question.

Additional eligibility criterion:

The **requested EU contribution** per project shall not exceed EUR 3 000 000.

HEALTH.2013.2.3.4-2: Drug development for neglected parasitic diseases. FP7-HEALTH-2013-INNOVATION-1. Projects will bring together promising European and global attempts to discover and develop drugs for neglected parasitic diseases. For the purpose of this call topic, neglected parasitic diseases include the kinetoplastid diseases (sleeping sickness, leishmaniasis, Chagas disease) and helminth diseases [lymphatic filariasis, onchocerciasis, schistosomiasis or soil-transmitted nematodes (Ascariasis, Trichuriasis, Hookworm)]. Proposals should focus either on:

- 1) Establishing a common drug discovery platform by joining experts in the field from industry and the public sector in Europe and disease-endemic countries. The resulting platform should have the capacity to undertake screening of compound libraries, lead development, testing in relevant animal models as well as toxicology and safety testing of new drug candidates. The drug discovery platform should address a minimum of three parasitic, with a balanced distribution of resources between them. In addition to the parasitic diseases mentioned above, the platform may also, if a clear synergy can be demonstrated, include malaria drug discovery activities, or:
- 2) Undertaking advanced clinical testing of new or improved drug candidates, including new formulations or combinations of already approved drugs. The drug candidate(s) to be addressed will already have undergone first-in-man testing.

⁴¹ For the purposes of this topic CEE comprises: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kosovo, Latvia, Lithuania, Former Yugoslav Republic of Macedonia, Moldova, Montenegro, Poland, Romania, Slovakia, Slovenia, Serbia and Turkey.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: SME-targeted Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: In recent years, European and global studies have been on-going to discover new drug leads or screen approved drugs for activity against neglected parasitic infections. This action is expected to gather a comprehensive portfolio of drug leads, and develop the most promising of these into drug candidates that can be tested in early clinical trials.

Specific requirements to be considered under the evaluation:

- SME-targeted research is designed to encourage SME efforts towards research and innovation.
- Leading role of research intensive SMEs.
- Leading role of SMEs with R&D capacities, but the coordinator does not need to be an SME.
- Expected outcomes being of clear interest and potential benefit to SMEs.

Additional eligibility criteria:

1. The **requested EU contribution** per project shall not exceed EUR 6 000 000.
2. The **estimated EU contribution going to SMEs shall be 15% or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

2.4 TRANSLATIONAL RESEARCH IN OTHER MAJOR DISEASES

2.4.1 Cancer

Research in this area will focus on disease aetiology; identification and validation of drug targets; prevention, early diagnosis, prognosis and treatment biomarkers; as well as on assessment of preventive, diagnostic, prognostic, and therapeutic interventions. In the long term, this area will contribute to reducing cancer incidence, morbidity and mortality and to improving the patients' and survivors' quality-of-life and treatment with fewer side-effects.

Note: For all topics in this area applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.2.4.1-1: Investigator-driven treatment trials to combat or prevent metastases in patients with solid cancer. FP7-HEALTH-2013-INNOVATION-1. The successful consortia will perform multicentre clinical trials assessing therapeutic strategies for localised or systemic metastases in patients with solid cancers or for preventing their development in patients with solid cancers. Consortia will use state-of-the-art technologies to ensure proper patient staging and assessment of treatment efficacy. The following

requirements and exclusions apply: endpoints, inclusion and exclusion criteria will be clearly described. The primary endpoint should be overall survival. The outcome of this research will be relevant for patients and have a potential to lead to changes in clinical practice. Applicants will have to demonstrate that clinical trials are appropriately powered to produce statistically significant evidence. Gender aspects and differences related to age groups will be appropriately considered. The clinical trials to be supported will have to be registered in a publicly accessible clinical trials registry and their results published in peer-reviewed journals. The applications will consider the relevant governance issues for clinical trials such as good clinical practice and respect of the appropriate international, European and national legislation and guidelines. Patient advocacy groups which can contribute to the quality, feasibility and impact of clinical trials, may be involved where appropriate.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected Impact: The expected results of research in this area should improve survival for a number of metastatic cancer subtypes with dismal survival rates, by providing stratified therapies with a higher therapeutic index.

Additional eligibility criterion:

The **requested EU contribution per project** shall not exceed EUR 6 000 000.

HEALTH.2013.2.4.1-2: Strengthening the cancer patient's immune system. FP7-HEALTH-2013-INNOVATION-1. The successful consortia will advance pre-clinical and/or clinical research concerning cancer immunotherapy towards improved treatment efficacy of future immunotherapeutic strategies. It may address one or more of the following areas:

- (1) cell, antibody or molecule-based immunotherapy;
- (2) therapeutic cancer vaccines directed against clinically relevant tumour and/or host antigens;
- (3) immune evasion impacting on clinically relevant tumour-host microenvironment interactions in localised or systemic disease.

Where appropriate tumour response criteria must be considered. Assays must be harmonised to validate cancer immunotherapeutic regimens in models or first-in-human trials. Involvement of industry, in particular SMEs, is strongly recommended.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected Impact: The expected results of research in this area will contribute to improving the efficacy of cancer immunotherapeutic regimens and clearly be of interest and potential benefit to SMEs.

Additional eligibility criteria:

1. The **requested EU contribution per project** shall not exceed EUR 6 000 000.

2. **The estimated EU contribution going to industry including SME(s) shall be 30% or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

HEALTH.2013.2.4.1-3: Investigator-driven supportive and palliative care clinical trials and observational studies. FP7-HEALTH-2013-INNOVATION-1. The successful consortia will perform multicentre clinical trials and/or observational studies aiming at improving quality-of-life of cancer patients or cancer survivors. The clinical studies may address symptoms caused by cancer, by cancer treatment, by long-term side-effects in cancer survivors or address symptoms that occur at the end of life. The following requirements and exclusions apply: endpoints, inclusion and exclusion criteria will be clearly described. The outcome of this research will have to be relevant for patients or survivors and have a potential to lead to changes in clinical practice. Applicants will have to demonstrate that clinical trials and/or observational studies are appropriately powered to produce statistically significant evidence. Gender aspects and differences related to age groups should be appropriately considered. The clinical trials to be supported need to be registered in a publicly accessible clinical trials registry and their results published in peer-reviewed journals. The applications need to consider the relevant governance issues for clinical trials such as good clinical practice and respect of the appropriate international, European and national legislation and guidelines. Patient advocacy groups, which can contribute to the quality, feasibility and impact of clinical trials, may be involved where appropriate.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected Impact: The results of research in this area will ultimately lead to improved comfort and quality-of-life of cancer patients and cancer survivors.

Additional eligibility criterion:

The **requested EU contribution per project** shall not exceed EUR 6 000 000.

2.4.2 Cardiovascular diseases

Collaborative research projects on cardiovascular diseases (CVD) have been supported in FP7 for an overall financial contribution of some EUR 163 million. This has allowed addressing the areas of atherosclerosis, aneurysm, congenital diseases, cardiomyopathies, CVD imaging, pharmacogenomics, systolic and diastolic heart failure, translational research and clinical trials in stroke, stem cell therapy for the treatment of heart ischemia, ventricular arrhythmias, atrial fibrillation, stent thrombosis and cardio-protection. For this call for proposals, topics will focus on the identification and validation of novel therapeutically relevant targets for the development of new medication for cardiovascular pathologies as well as on the clinical studies of cardiovascular technologies.

Note: For all topics in this area applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.2.4.2-1: Discovery research to reveal novel targets for cardiovascular disease treatment. FP7-HEALTH-2013-INNOVATION-1. The cutting edge research projects should explore further available and emerging molecular, genomic and other omics data from large-scale population studies and lead to the identification, characterisation and validation of *in vitro* and *in vivo* models of novel therapeutically relevant targets. Achieving this aim will have to be ensured by multidisciplinary research consortia with advanced biotechnological tools available.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: SME-targeted Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: The purpose of this research is to provide new targets for further drug discovery and development in the CVD area.

Specific requirements to be considered under the evaluation:

- SME-targeted research is designed to encourage SME efforts towards research and innovation.
- Leading role of research intensive SMEs.
- Leading role of SMEs with R&D capacities, but the coordinator does not need to be an SME.
- Expected outcomes being of clear interest and potential benefit to SMEs.

Additional eligibility criteria:

1. The **requested EU contribution per project** shall not exceed EUR 6 000 000.
2. The **estimated EU contribution going to SMEs shall be 30% or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

HEALTH.2013.2.4.2-2: Comparative effectiveness research of existing technologies for prevention, diagnosis and treatment of cardiovascular diseases. FP7-HEALTH-2013-INNOVATION-1. Cardiovascular technologies used in clinical practice including those used for imaging and therapeutic procedures may vary widely in different countries and even amongst centres. In addition, systematic evidence regarding how approaches to prediction, diagnosis, treatment, monitoring and prognosis compare with one another is lacking. The project will compare the use of *currently available* technical procedures and/or devices in selected broad populations. A comprehensive array of clinical and safety parameters, as well as socio-economic outcomes (e.g. quality of life, patient mortality, morbidity, costs, and performance of the health system) for chosen populations will be assessed. Randomised controlled trials, observational studies and meta-analyses may be considered for this topic. The study population should well address gender balance. Data sources to be used and methods to assess comparative effectiveness and cost effectiveness will be clearly defined. The project may include prospective data collection, development of clinical data networks, databases or patient registries. Dissemination activities aimed at raising awareness on the outcome of the study to the health care workforce may also be included, where appropriate.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: The purpose of this research is to inform patients, health care providers, and decision-makers, about which technologies are most effective in dealing with CVD.

Additional eligibility criterion:

The **requested EU contribution per project** shall not exceed EUR 6 000 000.

HEALTH.2013.2.4.2-3: Optimising lifestyle interactions in the prevention and treatment of cardiovascular disease across the lifespan. FP7-HEALTH-2013-INNOVATION-1.

Projects should examine the effects of primary and secondary prevention of cardiovascular diseases using *lifestyle intervention* strategies. Research may include understanding and optimising the dose-response relationship between physical activity and cardiovascular health, as well as the interaction(s) between physical activity, other lifestyle factors and pharmacotherapy. Projects should also combine *in vivo* and *in vitro* studies to advance our current understanding of the fundamental cellular and molecular mechanisms underpinning physical activity-dependent changes in cardiovascular health.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small-scale focused research project).

One or more proposals may be selected.

Expected impact: The purpose of this research is to provide solid evidence-based research to guide the prevention/treatment of cardiovascular diseases at primary/secondary levels. It might also lead to improved cohort stratification in existing clinical trial models. Successful application of lifestyle intervention strategies can be expected to yield substantial savings within existing unsustainable health care costs in the medium-to-long-term.

Additional eligibility criterion:

The **requested EU contribution per project** shall not exceed EUR 3 000 000.

2.4.3 Diabetes and obesity

Closed 2013

2.4.4 Rare diseases

Closed 2013

2.4.5 Other chronic diseases

Closed 2013

3. OPTIMISING THE DELIVERY OF HEALTHCARE TO EUROPEAN CITIZENS

This activity aims at providing further evidence to underpin policy decisions for the development of health systems as well as strategies for health promotion, disease prevention, diagnosis and therapy. Topics addressed cover Comparative Effectiveness Research (CER) in health systems and health services interventions and social innovation for health promotion.

3.1 TRANSLATING THE RESULTS OF CLINICAL RESEARCH OUTCOME INTO CLINICAL PRACTICE INCLUDING BETTER USE OF MEDICINES, APPROPRIATE USE OF BEHAVIOURAL AND ORGANISATIONAL INTERVENTIONS AND NEW HEALTH THERAPIES AND TECHNOLOGIES

This area focuses on appropriate use of behavioural and organisational interventions as well as therapies and health technologies to improve health and to foster applications of evidence-based decision making. Special attention will be given to patient safety to define best clinical practice and to patient involvement, wherever appropriate, in decision making in primary and specialised care. Gender aspects and differences related to age, socioeconomic status and other differentiating factors will be appropriately considered.

Note: For the topic listed below applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.3.1-1: Comparative effectiveness research (CER) in health systems and health services interventions. FP7-HEALTH-2013-INNOVATION-1. Projects will evaluate the impact of two or more alternative health system and health services interventions in terms of their health benefit, patient needs, patient safety, effectiveness and quality of care. Research should also address the structural and policy components as well as cost effectiveness. It should use a multidisciplinary approach and take into account some of the different organisation of care models within Europe. A broad array of interventions and approaches may be studied under this topic, ranging from comparing effects of different models of integrated care on patient experiences, outcomes, and efficiency or comparing integrated care with more traditional models of care; analysing the uptake of new approaches such as stratified, individualised or personalised medicine; comparing the effectiveness of different quality improvement strategies in disease prevention; to assessing interventions such as promoting prudent use of antibiotics or smoking cessation. Different population groups will have to be taken into account where relevant.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: Results should assist policy makers and decision makers to make informed decisions regarding the implementation or improvement of health system and health services interventions in view of improving patient outcomes, quality of life and increase the cost-effectiveness of interventions, ultimately improving health status at individual and population levels.

Additional eligibility criterion:

The **requested EU contribution** per project shall not exceed EUR 6 000 000.

3.2 QUALITY, EFFICIENCY AND SOLIDARITY OF HEALTHCARE SYSTEMS INCLUDING TRANSITIONAL HEALTH SYSTEMS

Closed 2013

3.3 HEALTH PROMOTION AND PREVENTION

This area focuses on developing evidence for best and most efficient public health measures with an impact on life style and interventions at different levels and in different contexts. Focus will be on the wider determinants of health and how they interact at both individual and community level.

Note: For the topic listed below applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.3.3-1: Social innovation⁴² for health promotion. FP7-HEALTH-2013-INNOVATION-1. EU research should aim to identify, develop and better understand innovative approaches to reduce sedentary behaviour and enhance the level of physical activity in the population. Research should include the evaluation of innovative on-going initiatives that reduce sedentary behaviour, enhance the level of physical activity combined with dietary or other interventions. In this context, research should include the identification of "good practices", as well as the analysis of their economic and social benefits and impact. Correlates will have to be detected (such as cultural, environmental, economic, psychological and others) that inhibit or promote the individuals capacity to increase physical activity, reduce sedentary behaviour and self-regulate their dietary or other relevant behaviour. Research may cover various areas affecting lifestyle (e.g. sports, health, education, transport, urban planning, working environment, leisure) as well as different intervention levels (local, national, European). As a social innovation it should address the role of diverse public and private entities, such as business, including social enterprises, civil society organisations and public authorities, as well as their interaction. The views of potential end-users should be integrated in the design of the project as well as the methodology for assessing impact and outcomes throughout the project. The project should have a strong communication strategy.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

⁴² Social innovations are new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations. In other words they are innovations that are not only good for society but also enhance society's capacity to act.
http://ec.europa.eu/enterprise/policies/innovation/policy/social-innovation/index_en.htm

It covers wide fields which range from new models of child care to web-based social networks, from the provision of domestic healthcare to new ways of encouraging people to exchange cars for bicycles in cities, and the development of global fair-trade chains. It may be a new product, service, initiative, organisational model or approach to the delivery of public services.

Expected impact: The relevant research should provide the necessary basis for empowering society to reduce sedentary behaviour, increase physical activity in everyday life, thus preventing major lifestyle related diseases. This includes identifying more effective and efficient evidence-based strategies for reducing sedentary behaviour and increasing physical activity together with supportive (multi-disciplinary) policy environments. This will result in a greater uptake of innovative approaches by policy makers and making it more appealing to citizens to choose a healthy lifestyle.

Additional eligibility criteria:

1. The **requested EU contribution** per project will depend on the needs of the project indicated in the proposal but shall not exceed EUR 6 000 000.
2. The **estimated EU contribution going to SMEs shall be 15 % or more** of the total estimated EU contribution to the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

3.4 INTERNATIONAL PUBLIC HEALTH & HEALTH SYSTEMS

Closed 2013

4. OTHER ACTIONS ACROSS THE HEALTH THEME

The objective of these actions is to contribute to the implementation of the Framework programmes and the preparation of future EU research and technological development policy.

4.1 COORDINATION AND SUPPORT ACTIONS ACROSS THE THEME

The focus of this area in this work programme will be on the dissemination and exploitation of results and on assessing future needs. For this call for proposals the focus of this area will be on technology transfer and dissemination of results.

Note: For all topics in this area applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.4.1-1: Supporting industrial participation in EU-funded research in the Health sector. FP7-HEALTH-2013-INNOVATION-1. This four year coordination action will support participants of running FP7 Health projects (as well as IMI⁴³ and EDCTP⁴⁴ projects), with focus on industry, especially European research performing SMEs. Specific objectives include at least the following activities: (i) to promote project participation of SMEs. The promotional activity should include participation in relevant events and organisation of workshops; (ii) to assist project participants through training activities,

⁴³ Innovative Medicines Initiative.

⁴⁴ European and Developing Countries Clinical Trials Partnership.

personalised tools and using new media; *(iii)* to provide support for consortium building and matchmaking for industry and academia preparing EU project proposals with the help of a matchmaking database; *(iv)* to provide tools (including an up-to-date database of health-related SMEs in Europe) to encourage cooperation between industry and academia and increase the participation rate of high-technology research-performing SMEs. *(v)* To provide support on IPR issues that may rise during funded projects' lifetime; *(vi)* to assist project participants with training activities and tools; *(vii)* to provide advice/information/training on valorisation of project results, knowledge transfer in view of future commercialisation covering for example business management, innovation financing sources, organisation of partnering events. The project will collaborate, complement and develop synergies with existing support structures such as National Contact Points, Enterprise Europe Network, knowledge-transfer networks, like the IPR helpdesk, EMA⁴⁵ SME Office etc.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Coordination Action or Support Action (coordinating action).

Only one proposal may be selected.

Expected impact: The promotional activity is expected to support the increase of industry, especially high-tech SMEs participation in EU-funded health research, enhancing Innovation Union and Lisbon objectives for contributing to technological evolution, innovation, competitiveness of European industry, economic growth and employment. Participation of industry, and high-technology research-intensive SMEs in particular, in health research projects will enhance innovation through the dissemination and exploitation of research results generated in EU funded health research activities with the political objective of giving to SMEs 15% or more of the EU contribution. The project is expected to help innovative SMEs in successfully participating into framework projects.

Additional eligibility criterion:

The **requested EU contribution** per project shall not exceed EUR 2 500 000.

HEALTH.2013.4.1-2: Interactions between EU legislation and health research and/or innovation and the effects of its application and implementation on health research and/or innovation. FP7-HEALTH-2013-INNOVATION-1. The action aims to analyse and evaluate the interactions between relevant EU legislation with related guidelines and health research and/or innovation, including but not limited to: the specific application and implementation of this legislation at national level in this field; developments in the application and implementation. Each action is expected to address a specific issue relating to one EU legislation of major importance for the research and outcome performed within the health area.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Coordination Action or Support Action (supporting action).

One or more proposals may be selected.

Expected impact: to better assess the effects of and interactions between the relevant EU legislation and research activities and related developments supported within this area using

⁴⁵ European Medicines Agency.

scientific analysis based on facts and figures. In particular, such projects are expected to constitute the evidence base that will help the Commission to identify ways to optimise the innovative potential, the efficacy in the drafting and application of current or future EU legislation.

Additional eligibility criterion:

The **requested EU contribution** per project shall not exceed EUR 500 000.

HEALTH.2013.4.1-3: Support for Presidency events: Organisation of supporting actions and events associated to the Presidency of the European Union. FP7-HEALTH-2013-INNOVATION-1. An integral part of the Health theme's activity is to organise, together with successive EU presidencies, events of a strategic nature. The proposed support action(s) will contribute to conferences or other appropriate events to be held in a MS which will hold a forthcoming Presidency of the European Union, specifically from mid-2013 to end 2014 Presidencies, in any area of the Health Theme. In order to ensure high political and strategic relevance, the active involvement of the relevant national authorities will be evaluated under criteria 'quality' and 'impact'. The proposed support action(s) should address topics that are of high relevance at the date of its taking place. An appropriate equilibrium should be present in the proposed action(s), with balanced presentation of various research, societal and industrial elements and points of view. Participation of non-EU stakeholders is possible. Outreach activities may be included such as *e.g.* a press programme and/or an event dedicated to raising awareness on a specific topic in schools or other specific audiences.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Coordination and Support Action (supporting action).

One or more proposals may be selected.

Expected impact: (i) review of research, industrial and/or societal developments linked to the areas of the Health Theme on specific programme level as appropriate; (ii) sharing of information and comparison of points of views; (iii) support to the activity of various stakeholders: ethicists, researchers, industrialists, investors, museums and/or schools.

Additional eligibility criterion:

The **requested EU contribution** per action shall not exceed EUR 100 000.

HEALTH.2013.4.1-4: Preparing the future for health research and innovation. FP7-HEALTH-2013-INNOVATION-1. Proposals for coordination actions are sought in important and/or emerging areas of health research, where there is a need to step up coordination efforts between European key players. Academia, industry, national programmes and other relevant organisations, should come together to develop a strategy plan for the further development of the targeted health research area with high impact on competitiveness, healthcare systems and benefit for European citizens' health. For all proposed activities European added value will have to clearly be discernible. Under this topic activities will be supported with the aim of assessing profoundly the research and/or innovation resources, gaps and needs of the thematic target area, and to evaluate its potential as a focal area for a future European innovation partnership. The expected work excludes research activities. Expert advice may be sought, and industry interest may be probed, such that in case of positive outcomes detailed roadmaps may be developed. Existing activities, such as project(s) aiming

at the development of strategic research agendas or roadmap-oriented activities will be taken into account and - where relevant - coordination with these will allow for synergies and exclude competition or duplication. In addition, the proposal will have to demonstrate how it intends to ensure maximum transparency and openness to all relevant stakeholders. Where health issues are at stake that go beyond the confines of Europe, consideration may be given to integration of European coordination efforts with pertinent other international initiatives such that Europe may play an active and leading role in the respective thematic area of health research. Relevant target institutions and channels for diffusion of the deliverables (reports, recommendations, roadmaps, etc.) will be clearly identified. The timeframe considered for implementation will also be duly justified.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Coordination and Support Action (supporting action).

One or more proposals may be selected.

Expected impact: Projects will contribute to preparing strong partnerships in key areas of health research, where important societal and/or economic return is expected. Where health issues go beyond Europe, projects may be used to coordinate the European participation in pertinent international activities.

Additional eligibility criterion:

The **requested EU contribution** per action shall not exceed EUR 500 000.

FP7-HEALTH.2013.4.1-5: Global initiative on gene-environment interactions in diabetes/obesity in specific populations. FP7-HEALTH-2013-INNOVATION-1. This action should support the coordination of research activities in the field of population research into diabetes and obesity that are currently funded by the European Commission, Members States and Associated Countries, together with other national funding agencies, notably in Mexico, New Zealand, Canada, the USA and Australia, as well as charities. It aims at aligning programmes and policies across Europe and the world, and contributing to increase sharing of best practice and best use of research and public health resources, including in associations with international initiatives such as the Global Alliance for Chronic Diseases⁴⁶. It should address the fragmentation of research activities develop synergies, and possible common strategic research agendas. It should integrate on-going and planned international projects, both EU funded and other, that address research on diabetes and obesity in specific populations. Part of the work to be undertaken is to convene international meetings as appropriate to follow up on the February 2012 Brussels conference "Diabesity – a world-wide challenge".

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Coordination Action or Support Action (coordinating action).

Only one proposal may be selected.

Expected impact: This action should improve the linking and efficient integration and coordination of relevant and complementary EU funded and international/national/regional

⁴⁶ The European Commission proposes to take part in the Global Alliance for Chronic Diseases – see Other Activities page 67.

research activities. It should provide a forum for exchange of information and best practices between the projects involved and the funding bodies, helping to create a transparent, dynamic and effective governing mechanism. Funding agencies will retain the governance of their action. The inclusion of existing and future international projects on the subject is expected to leverage on resources and avoid duplication. The structure should be kept open to allow for extended involvement of other funding bodies' projects. Ultimately, this action should lead to a self-sustainable network of funders in the area of diabetes/obesity research in specific populations, and its prevention, enabling the translation of information gained from innovative research and experiences into policy, social and economic benefits.

Additional eligibility criterion:

The **requested EU contribution** per project shall not exceed EUR 2 000 000.

FP7-HEALTH.2013.4.1-6: Mapping chronic non-communicable diseases research activities. FP7-HEALTH-2013-INNOVATION-1. This action should identify and analyse current EU-funded, as well as national and regional research programmes and initiatives in the field of chronic non-communicable diseases, their implementation modalities, funding sources and overall investments and output. The objective will be to map the scale and scope of research activities in this area, including the research fields addressed, with a view to identify potential overlaps, synergies, gaps and opportunities for collaboration. Adequate comparison of data and results should be ensured through the use of common definition criteria and methodology(ies).

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Coordination Action or Support Action (coordinating action).

Only one proposal may be selected.

Expected impact: This action should contribute to the development of evidence-based policies towards supporting coordinated approaches in chronic non-communicable diseases research.

Additional eligibility criterion:

The **requested EU contribution** per project shall not exceed EUR 2 000 000.

4.2 RESPONDING TO EU POLICY NEEDS

The objective of these actions is to contribute to the support and follow-up of other EU policies. The focus of these activities will be on research into age-appropriate use of medicines, drug safety research and methodologies for clinical trials in small populations in view of supporting regulatory decisions related to orphan drugs and personalised medicine approaches.

Note: For all topics in this area applicants will follow the rules for the **two-stage** submission procedure (see also respective call fiche in section III).

HEALTH.2013.4.2-1: Investigator-driven clinical trials for off-patent medicines using innovative, age-appropriate formulations and/or delivery systems. FP7-HEALTH-2013-INNOVATION-1. Proposals will address one of the options below:

A) for use in children (Regulation (EC) No1901/2006⁴⁷): Projects are expected to contribute to expanding the availability of medicines for children. Particular attention will be paid to age-appropriate formulations and of specific delivery systems for children. Projects will conduct appropriate clinical trials in children, respecting the current legislation and considering the ethical aspects and the particular needs of children and their families. Patient advocacy groups should be involved where possible and appropriate. The aim is to conduct clinical trials with the view of obtaining a PUMA (Paediatric Use Marketing Authorisation). Priority will be given to following areas, as mentioned in the EMA list of priorities for paediatric medicines:

www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/document_listing/document_listing_000092.jsp&murl=menus/regulations/regulations.jsp&mid=WC0b01ac05800260a4&jsenabled=true

Or

B) for use in the elderly: Projects are expected to contribute to expanding the availability of better suited medicines for the elderly by conducting clinical trials validating new drug formulations adapted to the needs of the elderly. Specificities such as potentially different drug absorption rates, metabolism particularities and co-morbidities should be taken into account where appropriate.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: Increased availability of medicines adapted to the specific needs of children or the elderly.

Additional eligibility criteria:

1. The **requested EU contribution** per project shall not exceed EUR 6 000 000.
2. The **estimated EU contribution going to industry including SMEs shall be 30% or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

HEALTH.2013.4.2-2: Adverse drug reaction research. FP7-HEALTH-2013-INNOVATION-1. Experiences with medicines that have been on the market for many years have shown that potentially serious adverse events may only become apparent long after their marketing authorisation. Projects to be funded in this topic will generate new knowledge on severe drug reactions and provide scientific evidence for post-authorisation risk assessment of medicinal products. Proposals will be based on pharmaco-epidemiological approaches focusing on adverse drug reaction research in one of the areas indicated below.

⁴⁷ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:378:0001:0019:en:PDF>

- Long term safety of antipsychotic medication in patients with dementia
- Genetic causes of adverse drug reactions: angiotensin-converting enzyme inhibitors and angioedema, and statin-induced myopathy
- Long-term adverse skeletal effects of bisphosphonates

Further details of the research objectives and expected deliverables are available on the website:

http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/document_listing/document_listing_000322.jsp&mid=

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small-scale focused research project).

One or more proposals may be selected.

Expected impact: Research should generate new knowledge on severe drug adverse events with potential implications in public health, i.e. those impacting on the balance of benefits and risks of medicinal products. This should be directed towards regulatory decisions on marketing authorisations for medicinal products including the warnings in product information for doctors and patients. A safer and more effective use of medicines should result with positive implications for public health.

Additional eligibility criteria:

1. The **requested EU contribution** per project shall not exceed EUR 3 000 000.
2. The **estimated EU contribution going to SME(s) shall be 15 % or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

HEALTH.2013.4.2-3: New methodologies for clinical trials for small population groups. FP7-HEALTH-2013-INNOVATION-1. The objective is to develop new or improved statistical design methodologies for clinical trials aiming at the efficient assessment of the safety and/or efficacy of a treatment for small population groups in particular for rare diseases or personalised (stratified or individualised) medicine. Research should be multidisciplinary and should involve all relevant stakeholders including industry and patient advocacy groups as appropriate. Ideally, results would lead to improvement of clinical trial guidelines. Clinical trials as such are excluded from this topic. Collaboration with relevant organisations outside Europe is welcomed.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding scheme: Collaborative Project (small-scale focused research project).

One or more proposals may be selected.

Expected Impact: Cost efficient clinical trials deriving reliable results from trials in small population groups.

Additional eligibility criterion:

The **requested EU contribution** per project shall not exceed EUR 3 000 000.

III IMPLEMENTATION of CALLS

HEALTH-2013-INNOVATION

Call identifier: FP7-HEALTH-2013-INNOVATION-1

Proposal submission and evaluation: two-stage procedure.

Date of publication: 10 July 2012⁴⁸

Deadline for stage 1 proposals: 02 October 2012 at 17:00:00 (Brussels local time)⁴⁹

Indicative budget: EUR 679.3 million from the 2013 budget⁵⁰

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and

Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

For description of the topics of the calls, please refer to section II 'Content of calls'

Table 1: Indicative budget lines

ACTIVITY/AREA	Indicative budget (EUR million)
1. BIOTECHNOLOGY, GENERIC TOOLS AND MEDICAL TECHNOLOGIES FOR HUMAN HEALTH	
1.2 DETECTION, DIAGNOSIS AND MONITORING	36
1.3 SUITABILITY, SAFETY, EFFICACY OF THERAPIES	60
1.4 INNOVATIVE THERAPEUTIC APPROACHES AND INTERVENTIONS	36
2. TRANSLATING RESEARCH FOR HUMAN HEALTH	
2.1 INTEGRATING BIOLOGICAL DATA AND PROCESSES: LARGE-SCALE DATA GATHERING, SYSTEMS BIOLOGY	
2.1.1 LARGE-SCALE DATA GATHERING	
2.1.1-1 Functional validation in animal and cellular models of genetic determinants of diseases and ageing processes	36
2.1.1-2 High impact research initiative on metagenomics for personalised medicine approaches	30

⁴⁸ The Director-General responsible for this call may publish it up to one month prior to or after the envisaged date of publication.

⁴⁹ The Director-General responsible for this call may delay this deadline by up to two months.

⁵⁰ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority.

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2.2 RESEARCH ON THE BRAIN AND BRAIN-RELATED DISEASES, HUMAN DEVELOPMENT AND AGEING	
2.2.1 RESEARCH ON THE BRAIN AND BRAIN-RELATED DISEASES	
2.2.1-1 Traumatic brain injury	30
2.2.1-2, -3, -4, -5 Mental health, neurology and pain	96
2.3 TRANSLATIONAL RESEARCH IN MAJOR INFECTIOUS DISEASES: TO CONFRONT MAJOR THREATS TO PUBLIC HEALTH	
2.3.0 CROSS-CUTTING PRIORITIES	
2.3.1 ANTI-MICROBIAL DRUG RESISTANCE	24
2.3.3 EMERGING EPIDEMICS	24
2.3.4 NEGLECTED DISEASES	33
2.4 TRANSLATIONAL RESEARCH IN OTHER MAJOR DISEASES	
2.4.1 CANCER	72
2.4.2 CARDIOVASCULAR DISEASES	54
3 OPTIMISING THE DELIVERY OF HEALTHCARE TO EUROPEAN CITIZENS	
3.1 TRANSLATING THE RESULTS OF CLINICAL RESEARCH OUTCOME INTO CLINICAL PRACTICE INCLUDING BETTER USE OF MEDICINES, APPROPRIATE USE OF BEHAVIOURAL AND ORGANISATIONAL INTERVENTIONS AND NEW HEALTH THERAPIES AND TECHNOLOGIESHEALTH CARE SYSTEMS	30
3.3 HEALTH PROMOTION AND PREVENTION	24
4 OTHER ACTIONS ACROSS THE HEALTH THEME	
4.1 COORDINATION AND SUPPORT ACTIONS ACROSS THE THEME	10.3
4.2 RESPONDING TO EU POLICY NEEDS	42

Table 2: Topics called:

Activity/Area	Topics called	Funding Schemes and additional eligibility criteria
1 BIOTECHNOLOGY, GENERIC TOOLS AND MEDICAL TECHNOLOGIES FOR HUMAN HEALTH		
1.2 DETECTION, DIAGNOSIS & MONITORING		
1.2	HEALTH.2013.1.2-1: Development of imaging technologies for therapeutic interventions in rare diseases. <i>One or more proposals may be selected.</i>	<i>SME-targeted Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000. The estimated EU contribution going to SME(s) shall be 30% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i>
1.3 SUITABILITY, SAFETY, EFFICACY OF THERAPIES		
1.3	HEALTH.2013.1.3-1: Modelling toxic	<i>Collaborative Project (large-scale integrating</i>

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	<p>responses in case studies for predictive human safety assessment.</p> <p><i>Only one proposal may be selected.</i></p>	<p><i>research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 12 000 000. The estimated EU contribution going to industry including SME(s) shall be 15% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i></p>
1.3	<p>HEALTH.2013.1.3-2: Innovative approaches to address adverse immune reactions to biomedical devices, implants and transplant tissues.</p> <p><i>One or more proposals may be selected.</i></p>	<p><i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000. The estimated EU contribution going to industry including SME(s) shall be 30% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i></p>
1.3	<p>HEALTH.2013.1.3-3: Safety and efficacy of therapeutic vaccines.</p> <p><i>One or more proposals may be selected.</i></p>	<p><i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000. The estimated EU contribution going to industry including SME(s) shall be 30% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i></p>
1.3	<p>HEALTH.2013.1.3-4: Development of alternative <i>in vitro</i>, analytical, immunochemical, and other test methods for quality control of vaccines.</p> <p><i>One or more proposals may be selected.</i></p>	<p><i>Collaborative Project (small-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 3 000 000. The estimated EU contribution going to industry including SME(s) shall be 30% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i></p>
1.4 INNOVATIVE THERAPEUTIC APPROACHES AND INTERVENTIONS		
1.4	<p>HEALTH.2013.1.4-1. Controlling differentiation and proliferation in human stem cells intended for therapeutic use.</p> <p><i>One or more proposals may be selected.</i></p>	<p><i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000. The estimated EU contribution going to SME(s) shall be 15% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i></p>
2 TRANSLATING RESEARCH FOR HUMAN HEALTH		
2.1 INTEGRATING BIOLOGICAL DATA AND PROCESSES: LARGE-SCALE DATA GATHERING,		

SYSTEMS BIOLOGY		
2.1.1 Large-scale data gathering		
2.1.1	HEALTH.2013.2.1.1-1: Functional validation in animal and cellular models of genetic determinants of diseases and ageing processes. <i>One or more proposals may be selected.</i>	<i>SME-targeted Collaborative Project (large-scale integrating research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 12 000 000. The estimated EU contribution going to SME(s) shall be 30% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i>
2.1.1	HEALTH.2013.2.1.1-2: High impact research initiative on metagenomics for personalised medicine approaches. <i>Only one proposal may be selected.</i>	<i>Collaborative Project (large-scale integrating research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 30 000 000. The estimated EU contribution going to industry including SME(s) shall be 30% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i>
2.2 RESEARCH ON THE BRAIN AND RELATED DISEASES, HUMAN DEVELOPMENT AND AGEING		
2.2.1 Research on the brain and brain-related diseases		
2.2.1	HEALTH.2013.2.2.1-1: Prospective longitudinal data collection and Comparative Effectiveness Research (CER) for traumatic brain injury (TBI). <i>One or more proposals may be selected.</i>	<i>Collaborative Project (large-scale integrating research project). Additional eligibility criterion: The requested contribution per project shall not exceed EUR 30 000 000.</i>
2.2.1	HEALTH.2013.2.2.1-2: Development of effective imaging tools for diagnosis, monitoring and management of mental disorders ⁵¹ . <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000. The estimated EU contribution going to industry including SME(s) shall be 30% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i>
2.2.1	HEALTH.2013.2.2.1-3: Paediatric conduct disorders characterised by aggressive traits and/or social impairment: from preclinical research to treatment. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000. The estimated EU contribution going to SME(s) shall be 15% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i>

⁵¹ As defined in the Diagnostic and Statistical Manual of Mental Disorders, 4th edition.

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2.2.1	HEALTH.2013.2.2.1-4: Patho-physiology and therapy of epilepsy and epileptiform disorders. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (large-scale integrating research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 12 000 000. The estimated EU contribution going to SME(s) shall be 15% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement a whole.</i>
2.2.1	HEALTH.2013.2.2.1-5: Understanding and controlling pain. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000.</i>
2.3 TRANSLATIONAL RESEARCH IN MAJOR INFECTIOUS DISEASES: TO CONFRONT MAJOR THREATS TO PUBLIC HEALTH		
2.3.0 Cross-cutting priorities		
2.3.0	HEALTH.2013.2.3.0-1: Innovation in vaccines. <i>One or more proposals may be selected.</i>	<i>SME-targeted Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000. The estimated EU contribution going to SME(s) shall be 30% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i>
2.3.1 Anti-microbial drug resistance		
2.3.1	HEALTH.2013.2.3.1-2: Stratified approaches to antibacterial and/or antifungal treatment. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000.</i>
2.3.3 Potentially new and re-emerging epidemics		
2.3.3	HEALTH.2013.2.3.3-1: Clinical management of patients in severe epidemics. <i>Only one proposal may be selected.</i>	<i>Collaborative Project (large-scale integrating research project). Only up to one proposal may be selected. Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 24 000 000.</i>
2.3.4 Neglected infectious diseases		
2.3.4	HEALTH.2013.2.3.4-1: Neglected infectious diseases of Central and Eastern Europe. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 3 000 000.</i>
2.3.4	HEALTH.2013.2.3.4-2: Drug development for neglected parasitic diseases. <i>One or more proposals may be</i>	<i>SME-targeted Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000. The estimated EU contribution going to</i>

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	<i>selected.</i>	<i>SME(s) shall be 15% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i>
2.4 TRANSLATIONAL RESEARCH IN OTHER MAJOR DISEASES		
2.4.1 Cancer		
2.4.1	HEALTH.2013.2.4.1-1: Investigator-driven treatment trials to combat or prevent metastases in patients with solid cancer. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000.</i>
2.4.1	HEALTH.2013.2.4.1-2: Strengthening the cancer patient's immune system. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000. The estimated EU contribution going to industry including SME(s) shall be 30% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i>
2.4.1	HEALTH.2013.2.4.1-3: Investigator-driven supportive and palliative care clinical trials and observational studies. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000.</i>
2.4.2 Cardiovascular diseases		
2.4.2	HEALTH.2013.2.4.2-1: Discovery research to reveal novel targets for cardiovascular disease treatment. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000. The estimated EU contribution going to SME(s) shall be 30% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i>
2.4.2	HEALTH.2013.2.4.2-2: Comparative effectiveness research of existing technologies for prevention, diagnosis and treatment of cardiovascular diseases. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000.</i>
2.4.2	HEALTH.2013.2.4.2-3: Optimising lifestyle interactions in the prevention and treatment of cardiovascular disease across the lifespan.	<i>Collaborative Project (small-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 3 000 000.</i>

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	<i>One or more proposals may be selected.</i>	
3. OPTIMISING THE DELIVERY OF HEALTHCARE TO EUROPEAN CITIZENS		
3.2 TRANSLATING THE RESULTS OF CLINICAL RESEARCH OUTCOME INTO CLINICAL PRACTICE INCLUDING BETTER USE OF MEDICINES, APPROPRIATE USE OF BEHAVIOURAL AND ORGANISATIONAL INTERVENTIONS AND NEW HEALTH THERAPIES AND TECHNOLOGIES.		
3.1	HEALTH.2013.3.1-1: Comparative Effectiveness Research (CER) in health systems and health services interventions. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000.</i>
3.3 HEALTH PROMOTION AND PREVENTION		
3.3	HEALTH.2013.3.3-1: Social innovation ⁵² for health promotion. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000. The estimated EU contribution going to SME(s) shall be 15% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i>
4 OTHER ACTIONS ACROSS THE HEALTH THEME		
4.1 COORDINATION AND SUPPORT ACTIONS ACROSS THE THEME		
4.1	HEALTH.2013.4.1-1: Supporting industrial participation in EU-funded research in the Health sector. <i>Only up to one proposal may be selected.</i>	<i>Coordination and Support Action (coordinating action). Additional eligibility criterion: Requested EU contribution per action: Maximum EUR 2 500 000.</i>
4.1	HEALTH.2013.4.1-2: Interactions between EU legislation and health research and/or innovation and the effects of its application and implementation on health research and/or innovation. <i>One or more proposals may be selected.</i>	<i>Coordination and Support Action (supporting action). Additional eligibility criterion: Requested EU contribution per action: Maximum EUR 500 000.</i>
4.1	HEALTH.2013.4.1-3: Support for	<i>Coordination and Support Action (supporting</i>

⁵² Social innovations are new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations. In other words they are innovations that are not only good for society but also enhance society's capacity to act.
http://ec.europa.eu/enterprise/policies/innovation/policy/social-innovation/index_en.htm

It covers wide fields which range from new models of child care to web-based social networks, from the provision of domestic healthcare to new ways of encouraging people to exchange cars for bicycles in cities, and the development of global fair-trade chains. It may be a new product, service, initiative, organisational model or approach to the delivery of public services.

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	<p>Presidency events: Organisation of supporting actions and events associated to the Presidency of the European Union.</p> <p><i>One or more proposals may be selected.</i></p>	<p><i>action). Additional eligibility criterion: Requested EU contribution per action: Maximum EUR 100 000.</i></p>
4.1	<p>HEALTH.2013.4.1-4: Preparing the future for health research and innovation.</p> <p><i>One or more proposals may be selected.</i></p>	<p><i>Coordination and Support Action (supporting action). Additional eligibility criterion: Requested EU contribution per action: Maximum EUR 500 000.</i></p>
4.1	<p>HEALTH.2013.4.1-5: Global initiative on gene-environment interactions in diabetes/obesity in specific populations.</p> <p><i>Only up to one proposal may be selected.</i></p>	<p><i>Coordination and Support Action (coordinating action). Additional eligibility criterion: Requested EU contribution per action: Maximum EUR 2 000 000.</i></p>
4.1	<p>HEALTH.2013.4.1-6: Mapping chronic non-communicable diseases research activities.</p> <p><i>Only up to one proposal may be selected.</i></p>	<p><i>Coordination and Support Action (coordinating action). Additional eligibility criterion: Requested EU contribution per action: Maximum EUR 2 000 000.</i></p>
4.1		
4.2 RESPONDING TO EU POLICY NEEDS		
4.2	<p>HEALTH.2013.4.2-1: Investigator-driven clinical trials for off-patent medicines using innovative, age-appropriate formulations and/or delivery systems.</p> <p><i>One or more proposals may be selected.</i></p>	<p><i>Collaborative Project (small or medium-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 6 000 000. The estimated EU contribution going to industry including SME(s) shall be 30% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i></p>
4.2	<p>HEALTH.2013.4.2-2: Adverse drug reaction research.</p> <p><i>One or more proposals may be selected.</i></p>	<p><i>Collaborative Project (small-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 3 000 000. The estimated EU contribution going to SME(s) shall be 15% or more of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.</i></p>
4.2	<p>HEALTH.2013.4.2-3: New methodologies for clinical trials for small population groups.</p> <p><i>One or more proposals may be selected.</i></p>	<p><i>Collaborative Project (small-scale focused research project). Additional eligibility criterion: Requested EU contribution per project: Maximum EUR 3 000 000.</i></p>

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It is important to note that the basic conditions for eligibility shall be met, such as the minimum number of participants (in most cases 3 from different MS or AC, except for supporting actions) or the budget ceiling for the maximum requested EU contribution. However **there is no obligation to go beyond the minimum number of participants unless additional partners are needed to achieve the objectives of the project.** The **duration of the project** shall be in line with the realistic planning of the project. The size of the **EU contribution** to the budget shall also be in line with the needs of the consortia, within the maximum EU contribution, but does not necessarily need to be the maximum.

The quality, feasibility, implementation and impact of the proposed work as well as the match between the expertise of the consortium and the project goals are subject to the evaluation carried out by independent experts.

In recognition of the opening of NIH⁵³ programmes to European researchers, participants established in the *United States of America* are entitled to participate and to receive funding⁵⁴ in all topics under this call.

Eligibility criteria for each proposal are checked by Commission staff before the evaluation begins. Proposals which do not fulfil any of the criteria will not be evaluated.

Eligibility criteria (stage 1 and stage 2):

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants for each funding scheme. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Table 3: Standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation and in the below format, unless otherwise specified in section II of the work programme.

Funding scheme	Minimum conditions ⁵⁵
Collaborative Project	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Action (coordinating action)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Action (supporting action)	At least 1 legal entity

⁵³ National Institutes of Health of the US Department of Health and Human Services

⁵⁴ In accordance with Article 29 of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

⁵⁵ These can differ for specific topics, please consult always the topic description in section II

The eligibility criteria will apply to both first and second stage proposals. At stage 1, only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to overall budget threshold (budget ceilings for requested EU contribution per project), while part B will be used to check the number of eligible participants. At stage 2, part A will be used alone to determine these eligibility criteria.

The following additional eligibility criteria apply in this call:

- **At stage 1 and stage 2**, it is important to note that the upper limits (ceilings) for the requested EU contribution given per topic in section II of this work programme will be applied as an additional eligibility criterion and proposals, which do not respect these limits, will be considered as ineligible.
- **At stage 2**, for topics requiring a certain percentage of EU funding going to SMEs or industry, the following additional eligibility criterion will be verified: Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) or industry is at the threshold (or more for the project as a whole) as set out with the respective topic description in section II. *The SME status and the financial viability will be finally assessed during the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.*

Evaluation procedure:

- The evaluation criteria and scoring scheme are set out in annex 2 to the work programme and the guide for applicants.
 - Proposal page limits: Applicants will ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission. No annexes are allowed to the proposal.
- The Commission will instruct the experts to disregard any pages exceeding these limits.
- The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, and left, right) should be at least 15 mm (not including any footers or headers).
- A two-stage submission and evaluation procedure will be used.
- Experts will carry out the individual evaluation of proposals remotely.
- **For the evaluation of topics "HEALTH.2013.2.1.1-2: High impact research initiative on metagenomics for personalised medicine approaches", "HEALTH.2013.2.2.1-1: Prospective longitudinal data collection and Comparative Effectiveness Research (CER) for traumatic brain injury (TBI)" and "HEALTH.2013.2.3.3-1: Clinical management of patients in severe epidemics", the Commission will organise hearings⁵⁶ at stage 2 with applicants as part of the panel deliberations for all proposals above threshold.**

⁵⁶ Details about the procedure are provided in an explanatory memorandum on the call web page.

Additional information regarding evaluation criteria and procedures:

- *For proposals failing to achieve a threshold for a criterion, the evaluation of the proposal will be stopped at the first criterion failing a threshold. Therefore for such proposals the ESR (evaluation summary report) will not contain marks and comments for the remaining criteria. Successful proposals will need to pass the minimum thresholds.*
- *In line with the objectives of each topic, additional evaluation criteria may be indicated in the work programme under the respective topic in section II.*
- *The following aspects will be considered for SME-targeted Collaborative Projects under the evaluation criterion relating to 'implementation':*
 - ➔ *Proposals are expected to have a substantial involvement of SMEs. As an indication of the expected level of involvement, evaluators should note that only proposals which fulfil the conditions as set out in the topic for the percentage of the estimated EU contribution going to SMEs will be eventually selected. The SME status and the financial viability will be checked definitively at the end of any negotiation.*
 - ➔ *The leading role of SMEs with R&D capacities: the coordinator does not need to be an SME, but the participating SMEs will need to have a decision making power in the project management, and the output should be for the benefit of the participating SMEs and the targeted SME-dominated industrial communities.*
- **Proposal ranking:** *The series of priority lists will be prepared by the panels of external experts, per indicative budget line as set out in table 1 of this call fiche. The aspects taken into account for establishing a priority order for ranking of proposals are set out in annex 2 of the work programme.*

Stage 1 proposals

- *Stage 1 proposals shall be submitted by the deadline mentioned above.*
- *Stage 1 proposals shall follow the instructions set out in the guide for applicants and in the proposal part B template available through electronic Submission Services of the Commission. Proposals should focus on the overall scientific and technological content and on clear identification of the milestones and deliverables to be reached (intended results), the intended use of the results and the expected impact (scientific, economic, social, environmental, etc. and as set out in section II under each topic) in a **maximum of 6 pages (excluding the cover page and the required tables)**. **No annexes are allowed to the proposal i.e. applicants have to strictly follow the template for part B and may not create more sections or annexes within this document.** The maximum page limits of each section shall be respected. The Commission will instruct the independent external experts (evaluators of proposals) to disregard any pages in excess of these limits. A minimum font size of 11 is required.*
- *Stage 1 proposals will be individually evaluated remotely by independent external experts and discussed in consensus meetings.*
- *Stage 1 proposals will be evaluated on the basis of the following two criteria: **Scientific/technological quality and Impact**. For each criterion, marks from 0 to 5 will be given, with the possibility of half-point scores. For proposals failing to achieve a*

threshold for a criterion, the evaluation of the proposal will be stopped at the first criterion failing a threshold. Therefore for such proposals the ESR (evaluation summary report) will not contain marks and comments for the remaining criteria. Proposals will need to pass the minimum thresholds as follows:

Table 4: Thresholds for evaluation criteria for first stage

Criterion	Minimum threshold
S/T quality	4/5
Impact	3/5
Overall threshold	8/10

- *All Proposals passing all thresholds will be retained at stage 1. Successful proposals will not receive an ESR⁵⁷.*
- *Coordinators of proposals retained at stage 1 (proposals passing the evaluation thresholds) will be invited to submit a complete proposal (stage 2 proposal) that will then be evaluated against the entire set of evaluation criteria. In line with the objectives of each topic, additional eligibility criteria may be indicated in section II of the work programme.*

Stage 2 proposals

- *The deadline for submission for stage 2 proposals will be specified in the invitation to submit. The **indicative deadline** for stage 2 proposals is in the beginning of February 2013.*
- *Stage 2 proposals shall follow the instructions set out in the guide for applicants and in the proposal part B template available through electronic Submission Services of the Commission. **No annexes are allowed to the proposal i.e. applicants have to strictly follow the template for part B and may not create more sections or annexes within this document.** The maximum page limits of each section shall be respected. The Commission will instruct the independent external experts (evaluators of proposals) to disregard any pages in excess of these limits. A minimum font size of 11 is required.*
- *Stage 2 proposals are evaluated on the basis of the following three criteria: **Scientific/technological quality, Implementation and Impact.***
- *For each criterion, marks from 0 to 5 will be given, with the possibility of half-point scores. For proposals failing to achieve a threshold for a criterion, the evaluation of the*

⁵⁷ See annex C of the "Rules for submission of proposals, and the related evaluation, selection and award procedures"; COMMISSION DECISION C(2011)1132 of 28 February 2011.

proposal will be stopped at the first criterion failing a threshold. Therefore for such proposals the ESR (evaluation summary report) will not contain marks and comments for the remaining criteria. Proposals will need to pass the minimum thresholds as follows:

Table 5: Thresholds for evaluation criteria for second stage

Criterion	Minimum threshold
S/T quality	4/5
Implementation	3/5
Impact	3/5
Overall threshold	12/15

- *In line with the objectives of each topic, additional evaluation criteria may be indicated in the work programme under the respective topic in section II.*
- *The following aspects will be considered for SME-targeted Collaborative Projects under the evaluation criterion relating to 'implementation':*

Proposals are expected to have a substantial involvement of SMEs. As an indication of the expected level of involvement, applicants and evaluators should note that only proposals which fulfil the conditions as set out in the topic for the percentage of the estimated EU contribution going to SMEs will be eventually selected.

The leading role of SMEs with R&D capacities: the coordinator does not need to be an SME, but the participating SMEs should have a decision making power in the project management, and the output should be for the benefit of the participating SMEs and the targeted SME-dominated industrial communities.

- *The SME and/or industrial status of participants and their financial viability will be checked definitively at the end of any negotiation of any kind of collaborative project requiring a certain SME and/or industrial participation.*

Proposal ranking at stage 2:

- *There will be differing numbers of proposals short-listed according to the topic description in section II and the available budget.*
- *However, there may be topics for which no proposals are of sufficient quality to be selected for funding, as there will be competition within topics and between topics on the basis of the quality of the proposals.*
- *The Commission ranked lists of proposals to be retained for negotiation will be based on the priority list established by the panel of independent external experts at stage 2 taking into account the budget available for each budget line (as indicated in this call for proposals). For each budget line, a number of proposals below the indicative budget cut-off line on the Commission ranked list may be kept on a reserve list to allow for eventualities such as the failure of negotiations on grant agreements, the withdrawal of*

proposals, budget savings agreed during negotiation, or the availability of additional budget from other sources.

Indicative timetable for Stage 1 and 2: The stage 1 evaluation should be finalised by mid December 2012. The deadline for stage 2 proposals will be in the beginning of February 2013. The evaluation of the stage 2 is expected to take place in March 2013. Overall evaluation results are estimated to be available within 3 months after the closure date for stage 2 proposals. It is expected that grant agreement negotiations for short-listed proposals begin in May 2013.

Consortium agreements: Participants in collaborative are required to conclude a consortium agreement. For **coordination and support actions** a consortium agreement is not mandatory.

Forms of grant and maximum reimbursement rates for projects funded through the Cooperation work programme are given in Annex 3.

Flat rates to cover subsistence costs: In accordance with Annex 3 to this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: https://ec.europa.eu/research/participants/portal/page/fp7_documents under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

Dissemination: Grant agreements of projects financed under this call for proposals will include the special clause 39 on the "Open Access Pilot in FP7". Under this clause, beneficiaries are required to make their best efforts to ensure free access to peer-reviewed articles resulting from projects via an institutional or subject-based repository.

FP7-HEALTH-2013-SMES-FOR-INNOVATION

Call identifier: FP7-HEALTH-2013-INNOVATION-2

Proposal submission and evaluation: two-stage procedure.

Date of publication: 10 July 2012⁵⁸

Deadline for stage 1 proposals: 25 September 2012 at 17:00:00 (Brussels local time)⁵⁹

Indicative budget: EUR 140 million from the 2013 budget⁶⁰

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and

Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

For description of the topics of the calls, please refer to section II 'Content of calls'

Table 1: Indicative budget lines

ACTIVITY/AREA	Indicative budget (EUR million)
0. HORIZONTAL TOPICS FOR COLLABORATIVE PROJECTS RELEVANT FOR THE WHOLE OF THEME HEALTH	95
2. TRANSLATING RESEARCH FOR HUMAN HEALTH	
2.3. TRANSLATIONAL RESEARCH IN MAJOR INFECTIOUS DISEASES: TO CONFRONT MAJOR THREATS TO PUBLIC HEALTH	
2.3.1 ANTI-MICROBIAL DRUG RESISTANCE	45

⁵⁸ The Director-General responsible for this call may publish it up to one month prior to or after the envisaged date of publication.

⁵⁹ The Director-General responsible for this call may delay this deadline by up to two months.

⁶⁰ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority.

Table 2: Topics called:

Activity/Area	Topics called	Funding Schemes
0. HORIZONTAL TOPICS FOR COLLABORATIVE PROJECTS RELEVANT FOR THE WHOLE OF THEME HEALTH		
0.1	HEALTH.2013.0-1: Boosting the translation of health research projects' results into innovative applications for health. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small or medium-scale focused research project).</i>
2.3. TRANSLATIONAL RESEARCH IN MAJOR INFECTIOUS DISEASES: TO CONFRONT MAJOR THREATS TO PUBLIC HEALTH		
2.3.1 Anti-microbial drug resistance		
2.3.1	HEALTH.2013.2.3.1-1: Drugs and vaccines for infections that have developed or are at risk of developing significant anti-microbial resistance. <i>One or more proposals may be selected.</i>	<i>Collaborative Project (small or medium-scale focused research project).</i>

Conditions for FP7-HEALTH-2013-INNOVATION-2:

It is important to note that once the basic criteria for eligibility are met – such as the minimum number of participants 3 and maximum 5 or the budget ceiling of EUR 6 million for the requested EU contribution or the maximum project duration of 3 years – within these limits it is up to the applicants to propose a number of partners, a duration of the project or the financial contribution requested from the EU. The budget should also be in line with the needs of the consortia, within the maximum EU contribution, but not necessarily at its maximum.

The quality, feasibility, implementation and impact of the proposed work as well as the match between the expertise of the consortium and the project goals are subject to the evaluation carried out by independent experts.

Eligibility criteria for each proposal are checked by Commission staff before the evaluation begins. Proposals which do not fulfil these criteria will not be included in the evaluation. However, a proposal can be declared ineligible at any time of the process.

Specific requirements to be considered under the evaluation:

- Specific innovation initiative designed to encourage strong SME efforts towards the translation of research results into innovative applications for health.
- Leading role of SMEs in the project.
- Developing a short business plan as part of the proposal clearly describing the valorisation of the technology(ies) when presenting a full proposal at stage 2.
- Expected outcomes of clear interest and potential benefit to SMEs.

Eligibility criteria (stage 1 and stage 2):

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants for this call. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Table 3: Minimum number of participating legal entities for the funding scheme used in this call, in line with the Rules for Participation.

Funding scheme	Minimum conditions
Collaborative Project	At least 3 independent legal entities, each of which is established in a EU Member State (MS) or Associated Country (AC), and no 2 of which are established in the same MS or AC

The eligibility criteria apply to both first and second stage proposals. At stage 1, only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to overall budget threshold (budget ceilings for requested EU contribution per project), while part B will be used to check the number of eligible participants. At stage 2, part A will be used alone to determine these eligibility criteria.

- The **requested EU contribution** per project shall depend on the needs of the project and shall not exceed a maximum of EUR 6 000 000.
- The proposed **project duration** indicated in the proposal may not exceed 3 years.
- **The number of participants is restricted** from 3 to 5 entities⁶¹, where **SME or SME joint venture participation is restricted** to entities established in EU Member States and Associated Countries.

In addition only at stage 2:

- **Participating SME(s) or SMEs joint venture** need to be 1) at least 51% owned and controlled by one or more individuals who are citizens of one of the EU Member States or Associated Countries or permanent residents in one of those countries, or 2) at least 51% owned and controlled by another business concern that is itself at least 51% owned and controlled by individuals who are citizens of, or permanent residents in those countries.
- The **estimated EU contribution going to SME(s) or SME joint venture shall be 50% or more** of the total estimated EU contribution to the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.
- The **financial viability of all partners** in selected projects needs to fulfil the Commission requirements. *The SME status and the financial viability will be checked definitively at the end of any negotiation.*

⁶¹ For minimum conditions please refer to table 3

Applicants invited to present a full proposal for stage 2 are requested to submit within the proposal a short business plan, clearly describing the valorisation of the technology. The short business plan is part of the proposal content within its page limitations given in the guide for applicants and the electronic Submission Services template.

Evaluation procedure for stage 1 and 2:

- The evaluation criteria and scoring scheme are set out in annex 2 to the work programme and the guide for applicants.
- A two-stage submission and evaluation procedure will be used.

Additional information regarding evaluation criteria and procedures for stage 1 and 2:

- For proposals failing to achieve a threshold for a criterion, the evaluation of the proposal will be stopped at the first criterion failing a threshold. Therefore for such proposals the ESR (evaluation summary report) will not contain marks and comments for the remaining criteria. Successful proposals will need to pass the minimum thresholds.
- In line with the objectives of each topic, additional evaluation criteria may be indicated in the work programme under the respective topic in section II.

Proposal ranking: The priority lists will be prepared by the panels of external experts, per indicative budget line as set out in table 1 of this call fiche.

Stage 1 proposals

- *Stage 1 proposals shall be submitted by the deadline mentioned above.*
- *Stage 1 proposals shall follow the instructions set out in the guide for applicants and in the proposal part B template available through electronic Submission Services of the Commission. Proposals will need to describe the overall scientific and technological content and clearly identify the milestones and deliverables to be reached (intended results), the intended use of the results and the expected impact (scientific, economic, social, environmental, etc.) and as set out in section II under each topic with a total maximum of 6 pages (excluding the cover page and the required tables). The maximum page limits of each section will need to be respected. No annexes are allowed to the proposal i.e. applicants have to strictly follow the template for part B and may not create more sections or annexes within this document. The Commission will instruct the independent external experts (evaluators of proposals) to disregard any pages in excess of these limits. A minimum font size of 11 is required. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).*
- *Stage 1 proposals will be evaluated remotely by independent external experts, including a remote consensus.*
- *Stage 1 proposals will be evaluated on the basis of the following two criteria: **Scientific/technological quality and Impact**. For each criterion, marks from 0 to 5 will be given, with the possibility of half-point scores. For proposals failing to achieve a threshold for a criterion, the evaluation of the proposal will be stopped at the first criterion failing a threshold. Therefore for such proposals the ESR (evaluation summary*

report) will not contain marks and comments for the remaining criteria. Proposals will need to pass the minimum thresholds as follows:

Table 4: Thresholds for evaluation criteria for first stage

Criterion	Minimum threshold
S/T quality	4/5
Impact	4/5
Overall threshold	8/10

- *All Proposals passing all thresholds will be retained at stage 1. Successful proposals will not receive an ESR⁶².*
- *Coordinators of proposals retained at stage 1 (proposals passing the evaluation thresholds) will be invited to submit a complete proposal (stage 2 proposal) that will then be evaluated against the entire set of evaluation criteria. In line with the objectives of each topic, additional eligibility criteria may be indicated in the work programme.*

Stage 2 proposals

- *The deadline for submission for stage 2 proposals will be specified in the invitation to submit. The **indicative deadline** for stage 2 proposals is in December 2012.*
- *Stage 2 proposals shall respect the maximum of 20 pages (excluding the cover page and the required tables) and shall follow the instructions set out in the guide for applicants and in the proposal part B template available through electronic Submission Services of the Commission. **The maximum page limits of each section will need to be respected. No annexes are allowed to the proposal i.e. applicants have to strictly follow the template for part B and may not create more sections or annexes within this document.** Proposals will need to describe the overall scientific and technological content and clearly identify the milestones and deliverables. A proper statistical section for clinical trials or experimental design will need to be provided where appropriate. In the section implementation the capacity to carry out the work and the leading role of the SMEs need to be described. In the section expected impact the intended results (scientific, economic,*

⁶² See annex C of the "Rules for submission of proposals, and the related evaluation, selection and award procedures"; COMMISSION DECISION of 28 February 2011

social, environmental, etc. and as set out in section II under each topic) are to be described.

- *Proposal page limits: Applicants shall ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission. **No annexes are allowed.***
- *The Commission will instruct the experts to disregard any pages exceeding these limits.*
- *The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, and left, right) should be at least 15 mm (not including any footers or headers).*
- *Stage 2 proposals are evaluated on the basis of the following three criteria: **Scientific/technological quality and Implementation and Impact.***
- *For each criterion, marks from 0 to 5 will be given, with the possibility of half-point scores. For proposals failing to achieve a threshold for a criterion, the evaluation of the proposal will be stopped at the first criterion failing a threshold. Therefore for such proposals the ESR (evaluation summary report) will not contain marks and comments for the remaining criteria. Proposals will need to pass the minimum thresholds as follows:*

Table 5: Thresholds for evaluation criteria for second stage

Criterion	Minimum threshold
S/T quality	4/5
Implementation	3/5
Impact	4/5
Overall threshold	12/15

The following aspects will be considered for proposals submitted to this call under the evaluation criterion relating to 'implementation':

- ➔ *Proposals are expected to have 50 % of the requested EU contribution going to SMEs or SME joint ventures from EU Member States or Associated Countries. Applicants and evaluators should note that only proposals which fulfil these conditions will be eventually selected. The SME status and the financial viability will be checked definitively at the end of any negotiation.*
- ➔ *The leading role of SMEs or SME joint ventures with R&D capacities: the coordinator does not need to be an SME, but the participating SMEs should have a decision making power in the project management (e.g. veto rights), and the output should be for the benefit of them.*
- ➔ *Within the limits of a maximum requested EU contribution of EUR 6 000 000, any amount requested from EU is possible; including very small amounts but the adequacy of resources/budget will be strictly scrutinized during the stage 2 evaluations.*

➔ *At stage 2 evaluators will also consider whether the participants will have the capacity to carry out the proposed short business plan.*

Proposal ranking at stage 2:

- *Proposals will be ranked per indicative budget line.*
- *There may be topics for which no proposals are of sufficient quality to be selected for funding.*
- *The Commission ranked lists of proposals to be retained for negotiation will be based on the priority list established by the panel of independent external experts taking into account the budget available for each budget line (as indicated in this call for proposals).*

For each budget line, a number of proposals below the indicative budget cut-off line on the Commission ranked list may be kept on a reserve list to allow for eventualities such as the failure of negotiations on grant agreements, the withdrawal of proposals, budget savings agreed upon during negotiation, or the availability of additional budget from other sources.

Indicative timetable for Stage 1 and 2: The stage 1 evaluation should be finalised by end of October 2012. The deadline for stage 2 proposals is expected to be mid December 2012. The evaluation of the stage 2 is expected to take place in January 2013. Overall evaluation results: estimated to be available within 2 months after the closure date for stage 2 proposals. It is expected that grant agreement negotiations for short-listed proposals would begin in February 2013.

Consortium agreements: Participants are required to conclude a consortium agreement. Even if an SME is not the coordinator, the protection of interests of the participating SMEs shall be guaranteed through appropriate governance mechanisms (e.g. veto right) within the consortium agreement.

Forms of grant and maximum reimbursement rates for projects funded through the Cooperation work programme are given in Annex 3.

Flat rates to cover subsistence costs: In accordance with Annex 3 to this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: https://ec.europa.eu/research/participants/portal/page/fp7_documents under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

Dissemination: Grant agreements of projects financed under this call for proposals will include the special clause 39 on the "Open Access Pilot in FP7". Under this clause, beneficiaries are required to make their best efforts to ensure free access to peer-reviewed articles resulting from projects via an institutional or subject-based repository.

IV OTHER ACTIVITIES⁶³ (NOT IMPLEMENTED THROUGH CALLS FOR PROPOSALS)

Human Frontier Science Programme Organisation

An annual subscription to the international Human Frontier Science Programme Organisation (HFSP)⁶⁴ will be made jointly with the Information and Communication Technologies (ICT) Theme. This will allow EU non-G8 Member States to fully benefit from the Human Frontier Science Programme (HFSP) and provide increased visibility for European research. Out of the total European Union subscription of EUR 4 672 000 for 2013, EUR 2 803 000 will be paid from this theme, and the remainder from the ICT Theme.

Funding scheme: CSA – subscription.

Conference: International efforts in rare diseases research

The aim of this conference is to increase the impact of EU-funded research in the context of the International Rare Diseases Research Consortium. Participants will be leading scientists from public and private sectors, representativeness of patient organisations, regulatory bodies and funding agencies.

Funding scheme: Coordination and Support Action – public procurement⁶⁵ to be implemented through a Framework Contract in 2013..

EU contribution (indicative budget: EUR 300 000).

Support for the organisation of conferences related to the Month of the Brain in 2013

Support is planned for two conference events for the Month of the Brain 2013, including one expected to be organised in association with the Irish Presidency. The objectives of those conferences are to mobilise stakeholders on the need to coordinate and optimise resources allocated to brain research and to raise awareness on the importance of brain health. Participants will be policy makers, funding agencies, scientists (private and public), patient organisations, citizens and employers.

⁶³ In accordance with Article 14, 17 and 27 of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

⁶⁴ The European Union is a member of the HFSP Organisation (HFSP) and has funded HFSP under previous Framework Programmes.

⁶⁵ In accordance with Art 14(b) of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

Funding scheme: Coordination and Support Action – public procurement⁶⁶: to be implemented through a Framework Contract in 2012/2013.

EU contribution (indicative budget: EUR 500 000).

Global Alliance for Chronic Diseases

The European Commission will make a contribution towards activities of the Global Alliance for Chronic Diseases (GACD). This will enable the European Commission to take part in GACD, which brings together leading health research funding agencies of key countries (currently USA, Australia, UK, Canada, China and South Africa) to coordinate research activities addressing on a global scale the prevention and treatment of chronic, non-communicable diseases such as cardiovascular diseases (mainly heart disease and stroke), diabetes and mental health. Recommendations of GACD are expected to have a fundamental value for future orientation of public health research policy. Funding will be provided through an action grant to: the secretariat of the GACD, hosted by University College London (UCL), Gower Street 1, WC1E 6BT, London, UK.

Funding scheme: CSA – named beneficiary

EU contribution (indicative budget: EUR 120 000).

European registry for human embryonic stem cell lines

A contribution will be made to ensure the continued registration of human embryonic stem cell (hESC) lines in a European registry maintained by Charité Universitätsmedizin Berlin. The aim is to gather and make available detailed information on the different hESC lines derived in Europe and beyond, thereby also avoiding needless creation of new cell lines. This registry operates through an internet website that will continue to provide high quality data about the lines (e.g. cell characteristics), details regarding their source and contact information regarding their location. Funding will be provided through an action grant to: Berlin-Brandenburg Centre for Regenerative Therapies – BCRT Charité - Universitätsmedizin Berlin, Augustenburger Platz 1, D-13353 Berlin, Germany.

Funding scheme: CSA – named beneficiary

EU contribution (indicative budget: EUR 500 000).

⁶⁶ In accordance with Art 14(b) of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

V BUDGET

THEME HEALTH - INDICATIVE BUDGET

Activities	2013⁶⁷ Budget EUR million⁶⁸
CALL FP7-HEALTH-2013-INNOVATION-1	679.30
CALL FP7-HEALTH-2013-INNOVATION-2	140.00
General activities (cf Annex) (details below)	8.94
OTHER ACTIVITIES: <ul style="list-style-type: none"> • Evaluations-Reviews (EUR 6.00 million) • HFSP0 (EUR 2.803 million) • Actions implemented through public procurements and grants to identified beneficiaries (EUR 1.42 million) 	10.22
Estimated total budget	838.46

⁶⁷ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority.

⁶⁸ The Budget figures given in this table are rounded to two decimals points.

GENERAL ACTIVITIES - INDICATIVE BUDGET

Activities⁶⁹	2013⁷⁰ Budget EUR million
CORDIS	1.40
Experts (evaluators and reviewers)	0.02
COST	7.45
EUREKA	0.07
Total	8.94

All budgetary figures given in this work programme are indicative. The final budgets may vary following the evaluation of proposals.

The final budget awarded to actions implemented through calls for proposals may vary:

- The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

For actions not implemented through calls for proposals:

- The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions;
- The final budget awarded for all other actions not implemented through calls for proposals may vary by up to 10% of the indicated budget for these actions.

⁶⁹ For more details see annex 4 of the work programme.

⁷⁰ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority.

WORK PROGRAMME 2013

COOPERATION

THEME 2

FOOD, AGRICULTURE AND FISHERIES, AND BIOTECHNOLOGY

(European Commission C(2012) 4536 of 9 July 2012)

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Objective:

Building a European Knowledge Based Bio-Economy¹ (KBBE) by bringing together science, industry and other stakeholders, to exploit new and emerging research opportunities that address social, environmental and economic challenges: the growing demand for safer, healthier, higher quality food and for sustainable use and production of renewable bio-resources; the increasing risk of epizootic and zoonotic diseases and food related disorders; threats to the sustainability and security of agricultural, aquaculture and fisheries production; and the increasing demand for high quality food, taking into account animal welfare and rural and coastal context and response to specific dietary needs of consumers.

I CONTEXT

Political landscape

Against the backdrop of the current economic situation and an increased global competition, the Union has defined a strategy to support smart growth and job creation '*Europe 2020 – A strategy for smart, sustainable and inclusive growth*'², highlighting the target of developing an economy based on knowledge and innovation. The Innovation Union Flagship initiative³ supports this strategy through specific commitments like the 'European Innovation Partnerships' aiming at speeding up the development of technologies needed to meet the major challenges identified. Research and innovation are recognised as key drivers of competitiveness, jobs creation, sustainable growth and social progress.

The work programme 2013 (hereafter WP2013) aligns with, and contributes towards, the objectives of Europe 2020, the Innovation Union Flagship initiative, and other EU policies, such as the Common Agricultural Policy; Common Fisheries Policy; Integrated Maritime Policy; Community Animal Health Policy; Water Framework Directive; Marine Strategy Framework Directive; General Food Law Regulation; and regulatory frameworks on relevant areas such as Key Enabling Technologies, the environment, health and safety, resource efficiency and waste. WP2013 also supports regional and cohesion policy, by including activities helping regions, in particular in coastal and rural areas, to develop smart specialisation strategies in the bioeconomy and increase the impacts of their research and innovation efforts on their economies by focussing on key sectors where they can develop interregional comparative advantage⁴.

There is a determined focus on fostering new ideas, supporting world class teams tackling significant societal challenges, and on ensuring that the fruits of our investments and innovative ideas can be properly exploited. In this respect this work programme represents a

¹ The term 'bioeconomy' includes all industries and branches of the economy that produce, manage or otherwise harness biological resources (and related services, supply or consumer industries), such as agriculture, food, fisheries and other marine resources, forestry.

² COM(2010) 2020 final

³ COM(2010) 546 final

⁴ See in particular KBBE.2013.2.3-02; KBBE.2013.3.3-02

smooth transition towards the proposed new research and innovation programme for 2014-2020: *'Horizon 2020'*⁵.

Approach for 2013

In line with the Strategy *'Innovating for Sustainable Growth: a Bioeconomy for Europe'*⁶, which the European Commission adopted on 13 February 2012, **the overall priority of WP2013 FAFB is bio-resource efficiency**: it supports indeed the shift towards a society which sustainably relies on biological resources (including waste) not only to produce safe food and feed, but also bio-based materials and bio-energy. In this regard, WP2013 will not only support research activities in food, agriculture and fisheries, and biotechnologies, but also the development of bioeconomy markets and EU competitiveness, through activities focused on innovation and demand-side measures.

This approach is also in line with the *Political guidelines of President Barroso* for the next Commission⁷, which states that "the economic and financial crisis and the scientific evidence of climate change have shown us that we need to invest more in sustainability", and requests that "each and every Community policy [...] be assessed and if necessary adapted in the light of climate change, whether we are talking about water use in agriculture, how to deal with coastal erosion or the implications for fisheries policy". The WP2013 also contributes to "take EU Research policy to a new level and make it one of the motors of our sustainable development", by making a "greater emphasis on innovation as a cross cutting way of equipping all sectors of our economy to be more competitive so that they face the future with confidence".

To achieve this, WP2013 will address societal needs, and therefore paves the way to the proposed Horizon 2020 through a challenge-driven approach. Despite the increasing budget compared to previous years, it includes fewer but broader and less prescriptive topics, allowing bottom-up approaches to deliver innovative ideas. Topics have been developed according to the suggested focus areas of the Horizon 2020 Societal Challenge "Food security, sustainable agriculture, marine and maritime research, and the bioeconomy". While the overall priority of WP2013 FAFB is **bio-resource efficiency**, it also contribute to addressing other major priorities, which have been defined so as to ensure the highest European added value, in areas where EU funding is needed to achieve critical mass for research and innovation:

- **Oceans of the future**: the EU Strategy for Marine and Maritime Research⁸ supports the EU integrated maritime policy's objective of a thriving maritime economy, making the most of marine resources in an environmentally sustainable manner. It helps deliver the full potential of the maritime economy to the 'EU 2020' goal of a smart, inclusive and sustainable growth for Europe. In this Framework, WP2013 support this strategic agenda, with four topics included in the joint call "The Ocean of Tomorrow 2013":

OCEAN 2013.1: Biosensors for real time monitoring of biohazard and man made chemical contaminants in the marine environment

⁵ COM(2011) 808 final

⁶ COM(2012)60

⁷ Political guidelines for the next Commission, José Manuel Barroso, 3 September 2009.

⁸ COM (2008) 534 final of 3.9.2008 - Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: "A European Strategy for Marine and Maritime Research: A coherent European Research Area framework in support of a sustainable use of oceans and seas".

OCEAN 2013.2: Innovative multifunctional sensors for in-situ monitoring of marine environment and related maritime activities

OCEAN 2013.3: Innovative antifouling materials for maritime applications

OCEAN 2013.4: Innovative transport and deployment systems for the offshore wind energy sector

The following topics also address related issues relevant to this priority:

KBBE.2013.1.2-08: Innovative insights and tools to integrate the ecosystem-based approach into fisheries advice

KBBE.2013.1.2-09: Diversification of fish species and products in aquaculture

KBBE.2013.1.2-10: Boosting the domestication of established farmed finfish species through selective breeding

KBBE.2013.1.2-11: Assessment of organic aquaculture for further development of European regulatory framework

KBBE.2013.3.2-01: Marine biotechnology ERA-NET

KBBE.2013.3.2-02: The CO₂ algae biorefinery

- **Water:** as an essential element for the production and transformation of renewable biological resources, water is also addressed in WP2013 in particular in the topic *KBBE.2013.2.5-02: Saving water and energy for resource-efficient food processing*

WP2013 contributes also to water related research to a certain extent with *KBBE.2013.1.2-01: Agro-forestry systems for Europe*

- **Secure clean and efficient energy:** both as a resource to use more efficiently, and as a resource to produce by innovative bio-processes, energy is also a priority of WP2013.

KBBE.2013.2.5-02: Saving water and energy for resource-efficient food processing

KBBE.2013.3.4-01: Preventing and valorising bio-waste in biorefineries

KBBE.2013.3.6-02: Synthetic Biology towards applications

- **Brain research:** WP2013 contributes to brain research by supporting activities studying the relations between the brain and eating behaviour distinguishing two drivers: food selection (quality of the food) and food intake (quantity of the food) and vice versa, the effect that food/diet could have on brain development and behaviour:

KBBE.2013.2.2-01: New technologies to study brain function in relation to eating behaviour

KBBE.2013.2.2-02: Factors influencing the human gut microbiome and its effect on the development of diet-related diseases and brain development

- **Anti-microbial resistance:** The Commission launched in November 2011 its Action plan against the rising threats from antimicrobial resistance⁹, including an intention to reinforce and coordinate research efforts. The European Parliament in its resolution on antibiotic resistance¹⁰ called for the use of antibiotics in livestock farming to be reduced and for alternative methods to be used. In this Framework, WP2013 support this Action Plan, with one topic *KBBE.2013.1.3-05 addressing the ecology of drug resistant bacteria and transfer of antimicrobial resistance throughout the food chain*. Additional topics addressing this Action plan can be found in other Work programmes of other FP7 Cooperation Themes: Health-2013 (HEALTH.2013.2.3.1-1, HEALTH.2013.2.3.1-2 and HEALTH.2013.3.1-1) and NMP-2013 (NMP.2013.1.2-2).

⁹ Commission Communication' Action plan against the rising threats from Antimicrobial resistance' COM(2011)748

¹⁰ B7-0295/2011

The following topics also address related issues relevant to this priority:

KBBE.2013.1.1-01: Development and exploitation of genomic data and tools, phenotyping approaches and breeding concepts to sustainable animal production systems

KBBE.2013.1.3-03: Sustainable animal production: an integrated and multi-factorial approach

KBBE.2013.3.5-01: New, fast, and reliable molecular detection methodologies

- Innovation dimension of the activities and bridging towards Horizon 2020

a) This work programme contains **innovation measures in support of activities closer to market** such as support to market-uptake, notably through more activities aimed at generating knowledge to deliver new and more innovative products, processes and services.

This includes activities of prototyping, testing, demonstrating, and proof of concept, such as a topic specifically supporting the demonstration of the market potential of biotechnological applications¹¹. WP2013 also includes activities specifically supporting the exploitation of research results of former Framework Programme projects, in the field of agriculture and forestry, and in the field of food, health and well-being¹².

Innovation is also encouraged by supporting demand-side measures such as pre-commercial procurement in bio-based products, standard-setting on key areas, such as antifouling materials for maritime applications and bio-based products, and regulatory needs such as on organic aquaculture¹³.

The focus on innovation is reflected in the description of the objectives and scope of the specific topics, as well as in the expected impact statements. The innovation dimension of the proposals will be evaluated under the 'Impact' evaluation criterion.

b) WP2013 supports also **broader aspects of innovation, notably non-technological innovation** such as new business models, for example by helping SMEs to deal with legal issues such as property rights or by supporting entrepreneurship skills development¹⁴. WP2013 also makes an effort to boost the design and implementation of creative ways of meeting social needs. Several topics are expected to lead to social innovation, for example to help wiser decision making in the forestry sector, or to support mental well-being through healthy diets¹⁵. WP2013 also supports new approaches stimulating innovation, such as the European Innovation Partnership on 'Agricultural Productivity and Sustainability'¹⁶.

c) In the area of food, agriculture and fisheries and biotechnologies, the **involvement of industry, and SMEs**, is crucial to translate research and innovation into market applications, and it is therefore strongly promoted. Participation of industry, stakeholders and end-users are encouraged in many topics¹⁷.

¹¹ See in particular: KBBE.2013.3.3-01; KBBE.2013.1.1-01; KBBE.2013.1.2-01; KBBE.2013.1.2-02; KBBE.2013.1.2-07; KBBE.2013.1.2-08; KBBE.2013.1.4-07; KBBE.2013.2.3-01; KBBE.2013.2.5-02; KBBE.2013.3.1-01; KBBE.2013.3.2-02; KBBE.2013.3.3-04; KBBE.2013.3.4-01; OCEAN.2013.1; OCEAN.2013.2

¹² See in particular: KBBE.2013.1.4-07; KBBE.2013.2.6-01

¹³ See in particular: KBBE.2013.3.3-03; KBBE.2013.1.2-09; KBBE.2013.1.2-11; OCEAN.2013.3

¹⁴ See in particular: KBBE.2013.2.3-02; KBBE.2013.1.2-08

¹⁵ See in particular: KBBE.2013.2.1-01; KBBE.2013.2.2-01; KBBE.2013.2.5-01

¹⁶ See in particular: KBBE.2013.1.4-08; KBBE.2013.2.3-02

¹⁷ See in particular: KBBE.2013.1.2-01; KBBE.2013.1.2-04; KBBE.2013.1.2-08; KBBE.2013.1.2-09; KBBE.2013.1.2-10; KBBE.2013.1.2-11; KBBE.2013.1.3-04; KBBE.2013.1.4-08; KBBE.2013.2.3-01;

SMEs have been identified as entities particularly prone to innovate. The analysis of former FP-funded projects has shown that involvement of SMEs indeed benefits projects, in particular on innovation aspects, and that it also benefits participating SMEs in return. In FP7 so far (2007-2011), Cooperation Theme 2 FAFB has allocated 12% of its budget to SMEs, which represented 16% of the number of participants. To build on this aspect, the draft WP2013 FAFB includes topics which are particularly relevant for SMEs. Two types of actions are applied to ensure appropriate SME participation: i) approximately half of topics require mandatory participation of SMEs. These topics specify a minimum share of the requested EU contribution that shall be allocated to SME participants (from 15% to 75%). In such topics, this minimal participation of SMEs is an eligibility criterion, which excludes proposals not fulfilling this criterion from being selected¹⁸. ii) several topics highlight that the participation of SMEs might be beneficial to achieve the expected impact of the project, such as the topic aiming at demonstrating the potential of biotechnological applications¹⁹.

d) WP2013 also supports **dissemination of research results and technology and knowledge transfer** activities, so that innovative knowledge can lead to innovative applications. In particular, a topic supports the creation of a network for the transfer of knowledge on traditional foods to SMEs²⁰.

With its strong focus on innovation, WP2013 will not only reinforce the EU's science base in the bioeconomy, but also provides tools to maximise the impact of research and innovation on European societies and economies.

- Strengthening the European research Area

WP2013 also contributes to the structuration of a European Research Area that will enable Europe to maximise its research and innovation potential. WP2013 supports existing and new public-public partnership initiatives, in particular via several topics establishing ERA-Net and ERA-Net+ aiming at the publication of joint calls, such as on Marine Biotechnology. Two topics also aim at supporting joint calls on climate-change related adaptation of agricultural systems in Europe by the Joint Programming Initiative on Agriculture, Food Security and Climate Change²¹, and in the area of organic agriculture and food. Complementary to this Work Programme, integrated maritime governance at sea basin level will continue to be promoted with contributions to the implementation of the Joint Baltic Sea programme, BONUS (Article 185). WP2013 also requests that particular efforts are made to integrate

KBBE.2013.2.3-02; KBBE.2013.2.5-02; KBBE.2013.3.1-01; KBBE.2013.3.3-01; KBBE.2013.3.3-03; KBBE.2013.3.3-04; KBBE.2013.3.4-01; KBBE.2013.3.6-01; KBBE.2013.3.6-02; OCEAN.2013.1; OCEAN.2013.2; OCEAN.2013.3

¹⁸ These topics are the following: KBBE.2013.1.1-01; KBBE.2013.1.2-02; KBBE.2013.1.2-03; KBBE.2013.1.2-04; KBBE.2013.1.2-05; KBBE.2013.1.2-07; KBBE.2013.1.2-08; KBBE.2013.1.2-09; KBBE.2013.1.2-10; KBBE.2013.1.3-01; KBBE.2013.1.3-02; KBBE.2013.1.3-03; KBBE.2013.1.3-05; KBBE.2013.1.4-07; KBBE.2013.2.3-01; KBBE.2013.2.5-02; KBBE.2013.2.6-01; KBBE.2013.3.1-01; KBBE.2013.3.2-02; KBBE.2013.3.3-04; KBBE.2013.3.4-01; KBBE.2013.3.5-01; KBBE.2013.3.6-01; KBBE.2013.3.6-02; OCEAN.2013.1; OCEAN.2013.2; OCEAN.2013.3

¹⁹ See in particular: KBBE.2013.1.4-08; KBBE.2013.2.3-02; KBBE.2013.3.3-01

²⁰ See in particular: KBBE.2013.1.1-01; KBBE.2013.1.2-05; KBBE.2013.1.2-07; KBBE.2013.1.2-08; KBBE.2013.1.2-10; KBBE.2013.1.2-11; KBBE.2013.1.3-03; KBBE.2013.1.3-04; KBBE.2013.1.4-08; KBBE.2013.1.4-11; KBBE.2013.1.4-12; KBBE.2013.2.1-01; KBBE.2013.2.3-01; KBBE.2013.2.3-02; KBBE.2013.2.4-01; KBBE.2013.2.5-02; KBBE.2013.2.6-01; KBBE.2013.3.1-01; KBBE.2013.3.1-02; KBBE.2013.3.3-01; KBBE.2013.3.3-03; KBBE.2013.3.5-01; KBBE.2013.3.6-01; OCEAN.2013.2

²¹ See in particular: KBBE.2013.1.4-01; KBBE.2013.1.4-02; KBBE.2013.1.4-03; KBBE.2013.1.4-04; KBBE.2013.1.4-05; KBBE.2013.1.4-06; KBBE.2013.3.2-01

research throughout Europe, also by the development of training programmes and Europe-wide networks for knowledge transfer²². WP2013 makes sure that regional aspects are well covered, by including actions which invite proposers to consider activities relevant to a larger and balanced distribution of Member States and regions. See in particular the topic supporting the development of the bioeconomy in regions, which is expected to help regions defining Smart Specialisation Strategies, so as to facilitate attracting public and private investment, in particular by making the most out of the Cohesion policy²³.

- International Cooperation²⁴

International cooperation is crucial to tackle challenges related to research in Food, Agriculture and Fisheries and Biotechnology, which are global by nature. It is therefore supported and encouraged throughout all the activities and all topics are open to the participation of third countries. Specific support to international cooperation in WP2013 will be based on a mutual benefits' approach and will focus on key strategic partners, where common priorities have been established to ensure scale and scope: China, on infectious diseases of animals and zoonoses, in line with the scope and priorities of the Strategic Forum for International S&T Co-operation²⁵; and industrialised partners²⁶ such as the members of the International KBBE Forum²⁷, on ecosystem approach to fisheries management, on diet-related diseases, and with the view to harmonise methodologies and standards in bio-based products. New cooperation opportunities will be sought with the neighbourhood countries on the issue of sustainable biomass production, with Mediterranean countries on agriculture and arboriculture, and with Latin America on biodiversity in agriculture. Twinning will continue between FP projects and similar projects funded by third countries, as an activity of programme-level co-operation to systematically link the research and innovation activities between the EU and strategic third countries partners²⁸.

- Cross-thematic approaches

In order to increase the socio-economic impact of EU funded research in key areas of the bioeconomy, WP2013 includes cross-thematic topics following its challenge-based approach. In particular, topics on diet-related diseases and mental well-being have been drafted in coordination with the Health Theme²⁹. The Commission recently launched its Action plan against the rising threats from antimicrobial resistance³⁰. A package of call topics for

²² See in particular: KBBE.2013.1.2-06; KBBE.2013.2.3-02; KBBE.2013.3.5-02

²³ See in particular KBBE.2013.3.3-02

²⁴ Topics particularly relevant for international cooperation include: KBBE.2013.1.2-08; KBBE.2013.1.3-04; KBBE.2013.1.2-01; KBBE.1.4-03; KBBE.2013.1.4-06; KBBE.2013.2.2-01; KBBE.2013.2.2-02; KBBE.2013.3.1-02; KBBE.2013.3.3-03;

²⁵ OJ C18 of 24.1.2009, p. 11.

²⁶ A financial contribution may be granted by the European Union in the case of a participating international organisation other than an international European interest organisation, or a legal entity established in a third country other than an international cooperation partner country, such as Australia, Canada, New Zealand, United States, etc, in accordance with Article 29 of the EU FP7 Rules for Participation (e.g. provided that such a contribution is essential for carrying out the indirect action).

²⁷ Australia, Canada, New Zealand

²⁸ The Commission reserves the right to ask the coordinators of FP7 projects, during the grant agreement negotiations, to include collaboration activities with projects financed by these third countries. The costs of these activities are expected to be approximately 1% of the total European Union contribution to these projects. Parallel funding is expected from the related research programmes in the third countries for counterpart projects. Twinning is currently on going with Canada, Australia and New Zealand on bio-products and food and with Argentina and Mercosur on plants, soil and food research.

²⁹ See in particular: KBBE.2013.2.1-01; KBBE.2013.2.2-01; KBBE.2013.2.2-02

³⁰ Commission Communication' Action plan against the rising threats from Antimicrobial resistance' COM(2011)748

proposals supporting the aims of this Action plan through reinforcing and coordinating research and innovation can be found in three FP7 Cooperation Work Programmes³¹.

Special attention will be paid to cross-cutting marine and maritime research with the launch of a new cross-thematic call "The Ocean of Tomorrow 2013": joining research forces to meet challenges in ocean management". It will be implemented jointly between Theme 2 "Food, Agriculture and Fisheries, and Biotechnology" (FAFB), Theme 4 "Nanosciences, Nanotechnologies, Materials and new Production Technologies" (NMP); Theme 5 "Energy", Theme 6 "Environment (including climate change)" and Theme 7 "Transport (including Aeronautics)". The main objective of the call is to promote research and innovation on marine technologies, in particular sensors, anti-biofouling materials, and innovative transport and deployment systems for the offshore energy sector. The topics and funding mechanisms will allow for large, multidisciplinary and multi-stakeholder topics with an appropriate balance between (basic/applied) research, knowledge transfer and demonstration, and to support a number of specific EU policies. The four topics are published in the Work Programmes of all participating Themes, as a cross-thematic call. "The Ocean of Tomorrow 2013" call (FP7-OCEAN-2013) is subject to a separate call fiche.

- Theme specific information

Socio-economic dimension of research: Where relevant, account should be taken of possible socio-economic impacts of research, including its intended and unintended consequences and the inherent risks and opportunities. A sound understanding of this issue should be demonstrated at the level of both research design and research management. In this context, where appropriate, the projects should ensure engagement of relevant stakeholders (e.g. user groups, farmers and fishermen, civil society organisations, policy-makers) and stimulate a multi-disciplinary approach (including, where relevant, researchers from social sciences and humanities). The work programme encourages participation by civil society organisations in all topics. Projects raising ethical or security concerns are also encouraged to be attentive to wider public outreach. Research activities should take into account the Protocol on the Protection and Welfare of Animals, and reduce – with a view to ultimately replacing – the use of animals in research and testing³². The principle of the three Rs (Replacement, Reduction and Refinement) should be applied in all research funded by the European Commission.

Participation by women and gender dimension in research: Seeking scientific knowledge and using it to serve society calls for talent, perspectives and insight that can only be secured by increasing diversity in science and the technological workforce. Therefore, equal representation of women and men at all levels in research projects is encouraged. Gender aspects in research are of particular relevance to Theme 2. For example, there may be differences between men and women as regards risk factors, biological mechanisms, behaviour, causes, consequences, management of and communication on diet-related diseases and disorders. Furthermore, roles and responsibilities, the relationship to the resource base (land management, agricultural and forest resources, etc.) and the perception of risks and benefits could have a gender dimension. Applicants should systematically address whether, and to what extent, gender aspects are relevant to the objectives and the methodology of

³¹ See in particular Health-2013 (HEALTH.2013.2.3.1-1, HEALTH.2013.2.3.1-2 and HEALTH.2013.3.1-1), KBBE-2013 (KBBE.2013.1.3-05) and NMP-2013 (NMP.2013.1.2-2).

³² Decision No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006 concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013) – OJ L 412 of 30.12.2006, p.1.

projects. In addition, specific actions to promote gender equality in research can be financed as part of the proposal³³.

³³ Appendix 7 of the Negotiation Guidance Notes:
http://ec.europa.eu/research/participants/portal/ShowDoc/Extensions+Repository/General+Documentation/Guidance+documents+for+FP7/Negotiations+and+amendments/negotiation_en.pdf

II CONTENT OF CALLS

This section describes all the topics for which proposals will be called in this work programme. This concerns only the content of the calls. For the practical modalities related to these calls, please refer to section III "Implementation of calls". For actions not implemented through calls for proposals, please refer to section IV "Other actions".

Activity 2.1 Sustainable production and management of biological resources from land, forest and aquatic environments

Research activities for Sustainable Agriculture and Forestry will foster systems-wide approaches with an emphasis on agro-ecological research, integrated concepts and production systems with a higher degree of diversity (e.g. agro-forestry systems, intercropping). Food security is assessed against global drivers like climate change. These broader research topics will be complemented by targeted activities addressing strategically important crops, genetic resources, and specific plant/animal pests and diseases and animal welfare issues. Initiatives for forest research will foster innovation for pest control and wood mobilisation. As part of enabling research, the provision of tools to foster the exploitation of 'omics' technologies will support innovation in livestock breeding. Implementation of the Action Plan against the rising threats from Anti Microbial Resistance (AMR) recently launched by the European Commission, will be supported by reinforcing the scientific basis and innovative means to combat AMR. In addition, specific actions are envisaged to help the assessment of the European agricultural research and innovation system and to look at the effects of trade relations and certification schemes on agricultural systems in Europe and with trade partner regions. In addition, there is a strong emphasis on innovation actions targeting the exploitation of results of former Framework Programme projects on one side, and on the strengthening of the European Research Areas in the Bioeconomy through the support of 4 ERA-NETs and 2 ERA-NET+ besides the significant financial support to the on-going BONUS Article 185 initiative for the Baltic Sea.

WP2013 will also contribute to unlocking the potential of aquatic living resources, with the aim to exploit them in a sustainable way and to secure food supply by focusing research activities towards the ecosystem approach to fisheries management and by boosting innovation in aquaculture through selective breeding for species already established and exploring the potential of new fish species. In addition, the potential of algae in converting CO₂ into high added-value products and biofuels will be further explored. A new "The Ocean of Tomorrow 2013" joint call will be launched in collaboration with other Themes to promote research and innovation on marine technologies, in particular sensors, anti-biofouling materials, and innovative transport and deployment systems for the offshore energy sector³⁴.

Area 2.1.1 Enabling research

Enabling research on the key long term drivers of sustainable production and management of biological resources (micro-organisms, plants and animals) including the exploitation of biodiversity and of novel bioactive molecules within these biological systems. Research will include 'omics' technologies, such as genomics, proteomics, metabolomics, and converging technologies, and their integration within systems biology approaches, as well as the development of basic tools and technologies, including bioinformatics and relevant databases, and methodologies for identifying varieties within species groups.

³⁴ Theme 4 "Nanosciences, Nanotechnologies, Materials and new Production Technologies" (NMP); Theme 5 "Energy", Theme 6 "Environment (including climate change)" and Theme 7 "Transport (including Aeronautics)"

KBBE.2013.1.1-01: Development and exploitation of genomic data and tools, phenotyping approaches and breeding concepts to sustainable animal production systems

Call: FP7-KBBE-2013-7 – single stage

The genetic selection of farmed animals is a highly efficient and cost-effective method for modifying animal performance. Up to now most of the emphasis has been on the private benefits it produces for breeders, farmers, retailers and consumers (feed efficiency, milk or meat production, etc.). However the method is expected to be highly efficient for addressing other issues of major public concern, including living with environmental changes, and improving animal health and welfare by harnessing now the benefits of advances in animal genetics and genomics.

The objectives are to exploit and to further implement whole genome sequence data and genomics tools for hunting the genetic components responsible for biological traits variation. The genetic structures of farm animal populations offer unique possibilities for the dissection of complex genetic traits. The aim is the development of innovative methodologies for analyzing the whole animal phenotype association and basic-biology phenotype association within the light of protein networks and biological pathways with the ultimate aim to better understand animal health, production traits and welfare mechanisms. All genotype and phenotype data developed during the project should be stored in an appropriate international infrastructure (repository). The active participation of relevant partners from outside Europe, in particular from the United States should add to the scientific excellence of the project and lead to an increased impact of the research; this will be considered by the evaluators.

The project should also pave the way for settling an improved programme for the education and the training of bio-informatician in animal science and the improvement of bioinformatics skills of biologists.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

One project may be funded.

Additional eligibility criteria:

- The requested European Union (EU) contribution shall not exceed EUR 9 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: Tools able to link accurately genomics data from farm animals to production, welfare and health traits will help getting the full benefits from the growing amount of these genomics data extensively generated recently. This will promote animal robustness by translating genomic information to:

- 1- predictive biology of animal health related traits
- 2- test these new concepts in genomic selection.
- 3- innovative tools for environmental impact), welfare and product quality.

This will be fruitful to support agricultural/veterinary research but it will also extend our knowledge pertaining to human biomedical research as accurate primary annotation information from farmed animals can be used to ‘reverse the flow’ of data to illuminate the human genome.

Area 2.1.2 Increased sustainability of all production systems (agriculture, forestry, fisheries and aquaculture); plant health and crop protection

Increased sustainability and competitiveness, while safeguarding consumer health, decreasing environmental impacts and taking account of climate change, in agriculture,

horticulture, forestry, fisheries and aquaculture through the development of new technologies, equipment, monitoring systems, novel plants and production systems, crop management through selected plant breeding, plant health and optimised production systems, the improvement of the scientific and technical basis of fisheries management, and a better understanding of the interaction between different systems (agriculture and forestry; fisheries and aquaculture) across a whole ecosystem approach. Research into maintenance of autochthonous ecosystems, development of biocontrol agents, and microbiological dimension of biodiversity and metagenomics will be undertaken.

For land based biological resources, special emphasis will be placed on low input (e.g. pesticides and fertilisers), and organic production systems, improved management of resources and novel food and feeds, and novel plants (crops and trees) with respect to their composition, resistance to stress, ecological effect, nutrient and water use efficiency, and architecture. This will be supported through research into biosafety, co-existence and traceability of novel plants systems and products, and monitoring and assessment of impact of genetically modified crops on the environment and human health as well as the possibility of their broader benefit for society. Plant health and crop protection will be improved through better understanding of ecology, biology of pests, diseases, weeds and other threats of phytosanitary relevance and support to controlling disease outbreaks and enhancing sustainable pest and weed management tools and techniques. Improved methods will be developed for monitoring, preservation and enhancement of soil fertility.

For biological resources from aquatic environments, emphasis will be placed on essential biological functions, safe and environmentally friendly production systems and feeds of cultured species and on fisheries biology, dynamics of mixed fisheries, interactions between fisheries activities and the marine ecosystem and on fleet-based, regional and multi-annual management systems.

KBBE.2013.1.2-01: Agro-forestry systems for Europe

Call: FP7-KBBE-2013-7 – single stage

Agro-forestry (AF) systems (including agro-silvo-pastoral systems) are recognised as systems delivering high economic returns to producers while at the same time providing important ecosystem services, such as carbon sequestration, attractive landscape for recreational activities, water, soil and biodiversity conservation. However, these systems are complex to establish and manage, they are knowledge intensive and need to be adapted and fine-tuned to local environmental and socioeconomic conditions. The project develops and tests combinations of diversified arable farming systems integrating trees, shrubs and livestock production to: a) better understand how AF systems function in regions where they are present; b) demonstrate their benefits and viability; and c) promote their adoption in Europe. Attention is paid to impact on the natural environment and to the balanced and efficient use of in-farm and external inputs and resources, such as soil, water, energy and nutrients, with the aim of improving the production of high quality products and the delivery of ecosystems services. The project addresses diverse pedo-climatic situations in Europe, covering as a minimum northern and southern regions. The proposed workplan is requested to show a strong participatory approach component by involving key stakeholders and end-users, such as extension services, farmers, forest owners and relevant organisations and associations, local/regional rural development programme managers and policy-makers, and by exploiting existing pilot farms for demonstration. Where relevant, work shall take into account experiences from countries where AF systems traditionally exist (such as Mediterranean Partner Countries) or have been recently adopted.

Funding Scheme: Collaborative Project (large-scale integrating project).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.

Expected impact: The project will provide better knowledge of existing and new intensive and extensive Agro-forestry systems and will help develop agro-ecological intensified mixed agricultural systems adapted to different European pedo-climatic conditions and more resilient to pronounced stress conditions. It will demonstrate the viability and the economic sustainability of the developed systems. It will support rural development and farm diversification while mitigating CO2 emissions.

KBBE.2013.1.2-02: Legume breeding and management for sustainable agriculture as well as protein supply for food and feed

Call: FP7-KBBE-2013-7 – single stage

Legumes are of major importance for European agriculture. While they used to be highly grown in agricultural rotations for their effect on nitrogen fixation in the soil and for the production of proteins for human food and feed, their cultivation has significantly decreased since the 60's, amongst others due to increased use of chemical fertilizers in crop production and to price competition from feedstock proteins produced in North and South America. This reduced use of legumes in European agriculture has created a strong disequilibrium for soils, biodiversity, sustainability and mitigation of environmental impacts of agriculture but also in terms of commercial balance and protein dependence, the European feed sector importing more than 70% of the proteins from outside Europe.

The overall objective of the topic is to increase the competitiveness and cultivation of grain legume crops for food and feed in European agriculture through the following actions:

- (1) Innovative breeding of a set of grain legume crops to allow for flexible and wider use in agriculture. The project will identify and prioritise targets for varietal improvement, such as yield stability, precocity and maturity date, resistance to biotic and abiotic stress, pollinator related traits, quality of the proteins for food and feed. Genetic resources that address these targets should be exploited. Advanced breeding tools including -omics technologies, genetic markers and phenotyping tools should be applied to help develop fast breeding approaches and support modernization of the legume breeding sector.
- (2) Development and testing of legume supported cropping systems, e.g. rotations, intercropping and varietal associations.
- (3) Selection of appropriate rhizobial strains to support nitrogen fixation and the development of inoculants.
- (4) Exploration of novel uses of legumes for human consumption taking into account consumer-focussed criteria for sustainability.

The project should take into account different European agro-ecological and climatic conditions. It will focus on European grain legume crops and exclude work on soya.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

Up to two projects may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 5 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: The project will generate breeding and management tools to reinforce the cultivation of legumes in European agriculture. It will thereby increase the availability of legumes in Europe and diversify protein supply for food and feed purposes. At farming level,

results will help to take advantage of the positive effects of legumes e.g. on soil fertility, N-fixation and fertilizer substitution.

KBBE.2013.1.2-03: Integrated approach towards small grain cereal production and diversification in Europe

Call: FP7-KBBE-2013-7 – single stage

Small grain cereals are widely produced crops in Europe with main ones such as wheat and barley accounting for a substantial share of the agricultural utilised area. Research under this topic aims at improving and diversifying European production of small grain cereals to increase their productivity, robustness, quality for various uses along with an improved adaptation to more variable environmental conditions, including resistance/tolerance to biotic and abiotic stresses.

Work proposed should follow a comprehensive approach addressing various aspects which could include:

- the characterisation, evaluation and use of genetic diversity (including crop wild relative and land race genetic resources) in breeding activities
- the development of genetic and genomic (pre-) breeding tools
- new breeding approaches including the creation of new population types
- crop management practices, e.g. for cultivation, pest and weed control, also in the context of mixtures and associations with other crops
- development of criteria and methods for grain quality testing

As regards 'minor' cereals – for which there is currently a minor European seed market – work should also explore the economic potential including possibilities for new food products from these crops, propose solutions to support their cultivation and broader introduction into the market taking into account regional characteristics.

Individual projects are requested to undertake the majority of their work either on 'major' OR 'minor' small grain cereals and within these categories outline the rationale for the choice of crops (one or several) and for the proposed scope of work in relation to the specific needs of the sector.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

Up to two projects may be funded, one targeting in particular 'major' small grain cereal crops (*Triticum aestivum*, *Hordeum vulgare*) and one in particular 'minor' small grain cereal crops (all others except rice; pseudo cereals are equally excluded). Attribution of proposals to either category ('minor cereals' or 'major cereals') must be clearly highlighted by the applicants at the time of submission, either in the title or abstract of the proposal. Therefore, in the ranking list, the highest ranked proposal for each category will have precedence over the following proposals from the other category even if it obtains a lower score.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 5 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: Project results will support both the breeding and farming sectors through the development of breeding tools, new varieties with increased genetic variation and improved agronomic, processing and nutritional characteristics. Farmers will particularly benefit from a wider range of available, adapted cereal genotypes, from improved and/or novel management practices to support crop performance as well as from additional venues for income through new products. Overall, the project will contribute to food security through more productive, diversified and resilient European cereal production while at the same time

supporting new (regional) markets for food, feed and non-food products and meeting demands of consumers for cereals with increased nutritional and health benefits.

KBBE.2013.1.2-04: Control of pests and pathogens affecting fruit crops

Call: FP7-KBBE-2013-7 – single stage

Pests and pathogens are a central concern for fruit crops and causing significant losses. Trade globalization and movement have facilitated the introduction and spread of plant harmful organisms. In the past years *Drosophila suzukii*, the spotted wing *Drosophila*, originally native in Asia has been described in Europe. Although the pest was recently introduced, serious damages have been reported in a number of fruits (cherries, berries, apricots, currants, figs and grapes). In addition, there is a number of other pests or pathogens of Plant Health concern (quarantine) affecting fruit production, some of which are already locally present in some EU Member States.

The project will look for effective and innovative solutions to control at least two pests/pathogens that cause big fruit losses and where management is a challenge. One of the studied pests/pathogens should be *Drosophila suzukii* and the other(s) should be quarantine pest(s)/pathogen(s). In the case of the latter, the quarantine pest(s) or pathogen(s) could be either present within EU territory or present(s) an increased threat for EU Member States. Work will provide insight into the biology of the pests/pathogens. The knowledge needs to be translated into the development of practical solutions for controlling the pests/pathogens and limiting damages to fruit production. In addition, the pathways that allowed the introduction and dissemination of the proposed pests/pathogens (i.e. *Drosophila suzukii* and other quarantine pest(s)/pathogen(s) if present) into the EU should be investigated, aiming at the development of preventive strategies/recommendations against the introduction of other dangerous fruit pests/pathogens and diseases. The need for international cooperation and linkages to third countries affected by the studied pests/pathogens is encouraged. The economic viability of the proposed alternatives to fruit crop protection should also be assessed. Budget distribution for the work on the various pests/pathogens needs to be well justified.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs). One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: Activities will result in increased knowledge and development of innovative solutions for pest and pathogen management, reduction of yield losses, and novel phytosanitary measures or products. The presence of Small and Medium Enterprises (SMEs) and industry will facilitate the translation of knowledge to practical solutions. This research is in support of EU Plant Health Policy³⁵.

KBBE.2013.1.2-05: Biological control agents in agriculture and forestry for effective pest and pathogen control

Call: FP7-KBBE-2013-7 – single stage

³⁵ http://ec.europa.eu/food/plant/index_en.htm

Climate change will probably influence more and more the occurrence, prevalence and severity of plant diseases. Moreover, the risk of biological invasions of new pest and pathogen populations and species to Europe is increased by the globalization of trade and transport. In addition to these, the availability of chemical agents to combat pests and pathogens is limited, since pesticides have proven to be often hazardous for both environment and human health and their use should be reduced or avoided whenever possible. Thus the need for the creation of new sustainable alternatives is significantly increased. Biological control of pests and pathogens can be an effective, sustainable and environmentally-friendly method for crop and forest protection as part of integrated pest management practices.

The project should focus on exploring new biological control agents against a range of important pests and pathogens that cause high economic losses to agriculture and forestry. Solutions should be sought for various cropping systems (protected and non-protected) and various types of forests. The environmental and economic sustainability of the proposed solutions should also be considered. The project is expected to cover also the development of production systems of these biological control agents so as to ensure rapid introduction into the market. Overlap with the research undertaken by the FP7 funded project 'PURE' or with the research proposed by the topic KBBE.2013.1.2-04: "Control of pests and pathogens affecting fruit crops" has to be avoided. Both sectors, agriculture and forestry, should be adequately addressed and subsequent budget distribution duly justified. Dissemination to stakeholders should be properly defined to ensure that results will reach, among others, advisory systems operating at national level, farmers and foresters.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 35% of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: Research will aim at the generation of knowledge and innovative solutions for pest and pathogen management. It will also support policy (i.e. Directive 2009/128/EC) laying down that all farmers will have to apply the general principles of integrated pest management by January 2014. The research should be targeted to products that can be sustainably and readily introduced into the market. The required percentage of SMEs will facilitate the translation of knowledge into commercial products. On the choice of biological agents, the demands to be met for registration under EU and national legislation, including risk assessment, should be taken into account.

KBBE.2013.1.2-06: Improved coordination and collaboration for EU Plant Health reference collections

Call: FP7-KBBE-2013-7 – single stage

The rate of entry and establishment of new, economically or environmentally damaging plant pests and pathogens and diseases has increased steadily over the last century as a result of expanding globalisation of trade in plants and plant products. This is potentially exacerbated by climate change, EU enlargement, and a decrease in the resources supporting plant health activities in the Member States.

One of the prerequisites for supporting statutory plant health is a reliable and up to date infrastructure of reference collections of regulated and emerging plant pests and pathogens, accessible to researchers and diagnostic laboratories, and the related scientific and technical

expertise. At present in the EU, reference collections of plant pests and pathogens vary in their quality and scope, accessibility, and quality of their management regimes.

The project aims at developing a network of national reference collections relevant to national and EU phytosanitary policy. In addition, it aims at creating guidelines for restoring, improving and updating of national reference collections (specimens, tissue and DNA). Furthermore, it should provide unhindered access to reference collections to National Plant Protection Organisations (NPPOs) and mandated diagnostic laboratories. It should include the definition of rules for provision and acquisition of reference material. It should provide harmonised quality assurance systems for reference collections, and good collection practice – including protocols for preparation, conservation, shipment and use of reference material. Additionally, links between the various databases of diagnostic tools will be sought, giving a good overview of the state of art. The project should include staff training in skills for handling, conservation, multiplication and use of reference material, including the correct use of DNA reference material.

The project is expected to seek synergies with other relevant FP7 projects (e.g. Q-Detect, QBOL, SharCo, ERA-NET EUPHRESCO etc.) and other ongoing national and EU initiatives.

Funding scheme: Coordination and Support Action (coordinating action).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 500 000 per proposal.

Expected impact: The project will lead to the creation of a model for sustainable collaboration, coordination and maintenance of trans-national reference collections and databases of diagnostic tools. Consequently, it will help prepare the way to establish EU Reference Laboratories for plant health diagnostics, in line with Regulation (EC) 882/2004. It will provide approved and validated methods and protocols as well as trained staff. It will also be in line with the Microbial Resource Research Infrastructure (MIRRI), which was recently launched by the European Strategy Forum on Research Infrastructures (ESFRI).

KBBE.2013.1.2-07: Novel practices and policies for sustainable wood mobilisation in European forests

Call: FP7-KBBE-2013-7 – single stage

The increased utilisation of wood as raw material and for energy generation offers – along with other renewable energy sources – opportunities for Europe to contribute to a more renewable energy future and thus to reduce its greenhouse gas emissions, to secure its energy supply and to maintain competitiveness, inter alia through enhancing sustainable regional and rural development.

In this context, and in order to provide increased amounts of wood of sufficient quality for its different uses while ensuring sustainable forest management, the project will develop innovative silvicultural and management practices and sustainable harvesting techniques and technologies adapted to different regions and different forest types in Europe. It will take into account their economic viability as well as their long-term impacts on, and the conflicts with, other forest functions, ensuring the vitality and health of forests and minimizing risks of harvesting damage (e.g. soil erosion and compaction, impacts on biodiversity and native species, etc).

Development of innovative services, co-operations and organizational structures could also contribute to overcome bottlenecks in resource mobilisation. In this context, it is important to understand the motivations and decision-making among forest owners, which are at the same time related to the uptake of new innovations and the design of policies affecting wood supply

decisions. The project will come up with innovative policy approaches taking into account the diversity of forest owners and forest ownership structures in Europe. It will provide recommendations, proposals for organisational designs and concrete actions that may enhance effective provision of wood and other public and private forest goods and services.

The project will include demonstration activities as well as dissemination of results to the operational level and decision-makers to ensure the uptake of the findings. The research will provide forest owners, forest managers, forestry extension services and policy-makers across Europe with practical recommendations and guidance.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 25 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: The project will result in increased availability and supply of wood to satisfy the growing demand of the forest-based industries and other operators, including renewable energy generation, thus contributing to the competitiveness of the sector and of rural areas. At the same time, it will minimise conflicts with or damage to other forest functions. In addition, the project will greatly improve our knowledge on how to best address segments of forest owners to ensure a more successful uptake of new innovations and a better design of policies.

The project will be well-suited to the involvement of SME's, fostering innovation in the sector.

KBBE.2013.1.2-08: Innovative insights and tools to integrate the ecosystem-based approach into fisheries advice

Call: FP7-KBBE-2013-7 – single stage

The challenge of implementing the ecosystem-based approach to fisheries management requires development and best use of innovative scientific methods, new tools and technologies as well as new statistical, modelling tools and assessment methods that go beyond the single-species approaches which used to be, to a large extent, the main sources of scientific advice. It will also require adaptation of current management objectives and practises.

The first objective of the project is to make the best use of new tools and technologies such as genetics, microchemistry, and isotope analyses to develop new knowledge on population distribution, spatial patterns of spawning components, stocks structure and definition, habitat preferences, species interactions (including food-web and predator-preys interactions), migration patterns, and some biological parameters such as growth and fecundity, for species targeted in fisheries carried out in EU waters as well as for other species caught incidentally or are affected by fisheries because of related impacts on their habitats or food sources.

The second objective is to develop innovative assessment methods that address multispecies concerns resulting from biological interactions between species. This includes consideration of biodiversity, food-web structures and habitat impacts including indicators of these. A new range of approaches supporting the development of new assessment tools, including ecosystems models such as size-based models and indicators of ecosystem function (e.g. size based metrics, stable isotopes, etc), among other options, should be considered and developed. These approaches and the ecosystem models should be tested on data rich marine ecosystems with a long history of fisheries exploitation, as well as on data poor systems using

simulations. The performance of these ecosystems models should be compared and evaluated with respect to their suitability for fisheries and environmental management purposes, and to their ability to predict responses of a multispecies community of fish to changes in fishing mortality. Future data requirements for correct implementation of these models should be also investigated.

The third objective is to develop an innovative decision support framework that serves to provide an evidence basis for policy makers about the trade-off between various management options on a multispecies basis. The project shall utilise the assessment methods developed under the second objective as a basis to develop interactive and integrated tools for decision support and include a series of case studies of possible approaches, involving iterative management plan development with stakeholder involvement and considering the socio-economic effects.

Modelling development and management aspects should be based on close cooperation with the fishing industry in order to integrate fishers' knowledge. In addition, training actions will have to be planned between scientists and stakeholders (including fishing sector, international scientific organisations providing scientific advice on fisheries management and competent authorities for decision-making).

The project should use available information (including historical data sets) from the EU Data Collection Framework³⁶. It should also liaise with other relevant national and international research initiatives (e.g. on-going FP7 research activities such as FP7 ECOKNOWS, MYFISH and BENTHIS projects).

The project should address the regional dimension of the Common Fisheries Policy (CFP) and at least one case study should be developed in each of the following regional seas: Baltic Sea, North Sea, Northern and Western Waters, and Mediterranean and Black Seas.

Participation of relevant partners from Australia, Canada and New Zealand will add to the scientific and/or technological excellence of the project and ensure effective uptake of on-going international efforts for the implementation of the ecosystem-based approach to fisheries management.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 15% total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.
- The duration of the proposed project shall be maximum 4 years.

Expected impact: The project will provide new knowledge, methods, models and tools to support the integration of an ecosystem-based approach in fisheries advice and to support decision-making for ecosystem based fisheries and environmental management. It will be of high relevance to the future management of marine living resources and will support proper implementation of the new CFP, the Marine Strategy Framework Directive (MSFD) and the Habitat Directive.

KBBE.2013.1.2-09: Diversification of fish species and products in European aquaculture
Call: FP7-KBBE-2013-7 – single stage

Finfish aquaculture in Europe is largely dominated by few species that provide most of the current production both in terms of volume and value. However, despite the progress made so

³⁶ EC Council Regulation No199/2008 and Commission Decision 2008/949

far in controlling the biological processes it seems that the capacity of the European and global markets to absorb these products has now become an important limiting factor. Therefore, potential for growth might also depend henceforth on the capacity of the sector to exploit sustainably the aquatic biodiversity through species diversification.

The aim of the project will be to explore the biological and socio-economic potential of new/emerging candidate fish species and subsequently support the diversification of the activity in terms of species, aquaculture products and markets. This will require a particular effort of research and innovation in understanding new biological models, while developing adequate husbandry practices and technologies.

Considering that throughout Europe work on several "new species" is already ongoing covering different aspects and with different levels of advance and intensity, the project, instead of implementing a "whole lifecycle" approach, will build (without overlapping) on recent and ongoing initiatives and will focus only on targeted issues (i.e., related to reproduction and/or larval rearing and/or nutrition and/or fish health and/or husbandry technology, etc) that constitute to date the main bottlenecks in an aquaculture production context for the fish species that will be considered. Therefore the project will aim at providing specific solutions (e.g., protocols, adequate husbandry methods and technology, (cost-) efficient feeds and veterinary treatments/solutions, preventive veterinary medicines, etc) to specific, species-related documented problems. The species considered by the proposals will be selected based on their documented biological (e.g., availability of broodstock, short time to market size, fillet yield, flesh quality, etc) and economical (e.g., production costs, markets' availability, consumers' acceptability, suitability for product diversification and added value etc) potential for allowing growth of the European aquaculture sector.

The proposals will include a strong socio-economic component with particular emphasis on the potential of each species considered for adding value to aquaculture products along the seafood chain from the farm to the consumer and boosting competitiveness of the sector. Social, economical, market, cultural and legal aspects will be considered. In particular, the project will focus on new products development (as well as on adding value to raw products), will address European and global markets dynamics, marketing and quality standards, certification schemes, competition from local and imported commodities and will provide solid elements for establishing efficient price strategies. It will also consider consumers' and retailers' preferences for new farmed species as well as, for new added value aquaculture products.

Work on the following species will be considered out of the scope of the topic: Atlantic salmon (*Salmo salar*), rainbow trout (*Oncorhynchus mykiss*), carp (*Cyprinus carpio*), sea bass (*Dicentrarchus labrax*), sea bream (*Sparus aurata*), turbot (*Scophthalmus maximus*), European eel (*Anguilla anguilla*), bluefin tuna (*Thunnus thynnus*) and Atlantic cod (*Gadus morhua*).

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.
- The duration of the proposed project shall be minimum 5 years.

Expected impact: The project will anticipate future success story(ies) in European aquaculture. It will contribute in identifying the most appropriate candidates for fuelling the future growth of the European aquaculture sector. It will remove bottlenecks in science,

markets and consumers' perception/preferences. It will contribute in providing solutions to specific obstacles hampering the mastering of the biological cycle of new species in a production context. It will identify the most adequate options for developing new and competitive aquatic food products in the markets and will pave the way to the development of new markets for new products through the concomitant development of new species biological production and adequate market prospects.

KBBE.2013.1.2-10: Boosting the domestication of established farmed finfish species through selective breeding

Call: FP7-KBBE-2013-7 – single stage

Research and technological development have been essential in mastering the biological cycle of the main European aquatic farmed species and making possible the establishment of relatively stable aquaculture productions. Henceforth, targeted selective breeding will be critical for consolidating the biological pillar of the European aquaculture sector by enhancing predictability of the production and introducing productivity gains and subsequently result in improving the competitiveness of these European seafood products.

The main objective of this project will be to stimulate the development of breeding programmes and/or underpin the existing ones in the following fish species: Atlantic salmon (*Salmo salar*), rainbow trout (*Oncorhynchus mykiss*), carp (*Cyprinus carpio*), sea bass (*Dicentrarchus labrax*), sea bream (*Sparus aurata*) and turbot (*Scophthalmus maximus*). The effort will be equally distributed among these species.

The project will focus on the improvement of specific traits (individual or combined selection strategies), according to their biological and economical potential, according to the biological challenges and needs of the species concerned, as well as, to the needs of the producers and the European seafood sector in terms of final product quality and potential for product diversification.

In particular, the project will investigate the possibilities for measurable/quantifiable genetic improvement by focusing in priority on some of the following traits: 1) resistance to pathogens and diseases that hamper the production and for which no efficient vaccine or no cost/efficient prevention/treatment method exist, 2) growth and filleting yield, 3) adaptability to alternative feeds (and changing diets which satisfy species' specific needs) and flesh quality. Other specific, clearly defined and measurable traits maybe considered, assuming that their interest and potential for the species concerned is demonstrated in the proposal.

The project will develop (and/or adapt existing) adequate tools and methods (ideally non-lethal) for the measurement of the selected traits and general fitness in an aquaculture context. Phenotypic, molecular and genetic correlations between the traits considered (and eventually other relevant traits) will be addressed, in particular to avoid unfavourable selection for correlated traits. Protocols and appropriate assessment tools for the monitoring of the selection process and related breeding programmes will also be developed.

The proposal will also include a horizontal component aiming at assessing the economic impact of the project. The analysis should include an economic assessment traits considered for selection, as well as, an overall cost-benefit analysis of selective breeding. An economic review of existing breeding programmes should be conducted to evaluate the potential productivity gains and economic effects to the sector. Furthermore, producers' and consumer's perception of aquaculture selective breeding methods, technologies and products should be considered. A training component will ensure efficient transfer of knowledge and technology towards relevant end-users (scientists, breeders and producers).

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 25 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.
- The duration of the proposed project shall be minimum 4 years.

Expected impact: The project will provide knowledge and tools for boosting the development of breeding programmes in the European finfish farming sector. It will contribute in the production of fish with traits of interest (according to the biological, physiological and environmental challenges faced by each species concerned and in particular those related to disease prevention). It will make possible gain in productivity and/or reduction of production costs through selection. It will contribute to the optimization of selection strategies/programmes for the species concerned and will provide measurable estimates of biological and economical benefits from the methods/tools/selection strategies implemented.

KBBE.2013.1.2-11: Assessment of organic aquaculture for further development of European regulatory framework

Call: FP7-KBBE-2013-7 – single stage

Organic aquaculture is a relatively young market segment, which as of 2009 is regulated at the EU level (EC Regulation 710/2009). An assessment of existing research is needed together with few targeted studies on specific issues related to the implementation of the aforementioned regulation. The aim of this project is to enhance the economic development of organic aquaculture and strengthen the science base of the existing regulatory framework to support a possible future revision of this regulation (currently planned for 2013). Proposals should identify the issues that need to be addressed and be based on the review of new and existing knowledge from previous and on-going EU, regional and national projects. The relevance of their outputs in relation to the implementation of the organic aquaculture regulation will be assessed. Among others, particular emphasis will be given to issues related to farmed species health and veterinary treatments, fish welfare, optimal slaughtering procedures, as well as, to issues related to nutrition and sustainable feeds for aquatic animals farmed under organic production conditions. Furthermore, issues such as stocking density and sourcing organic juveniles need attention. Production - environment interactions need to be analysed to uncover thresholds for an eco-functional intensity of organic production in line with organic farming principles. Closed recirculation systems as discussed in the context of the Codex Alimentarius Guidelines on organic production should be also looked at, while at the same time ensuring fish a good living environment that satisfies their needs. Socio-economic investigations of the relationship between organic certification and competitiveness as well as studies on consumer perceptions and sentiments are necessary to guide farmers, regulators, policy makers as well as market actors towards the acceptance of this innovative new sector and to promote its further development. The project will explore the relationship between organic certification (and other certification schemes) and competitiveness of the European aquaculture sector, as well as, the potential for further development of European organic aquaculture in the context of the global seafood market.

Funding scheme: Coordination and Support action (supporting action).

One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 1 500 000 per proposal.
- The duration of the proposed project shall be minimum 3 years.

Expected impact: Providing scientific advice on the relevant regulatory framework, the project will contribute to the further economic growth of this aquaculture segment. The results will create a scientific basis for a possible future revision of the EU rules for organic aquaculture taking into account different fish species and production systems. The outputs of the project should contribute in reassessing the relevance, measurability and applicability of the technical provisions of the regulation and will contribute in providing science based recommendations for potential updates. Consumer confidence for aquaculture products will improve based on the broad dissemination of the obtained scientific knowledge and good communication from stakeholders.

Area 2.1.3 Optimised animal health, production and welfare across agriculture, fisheries and aquaculture

Optimised animal health, production and welfare, across agriculture, fisheries and aquaculture, inter alia through the exploitation of genetic knowledge, new breeding methods, improved understanding of animal physiology and behaviour and the better understanding and control of pests, parasites and infectious animal diseases and other threats to the sustainability and security of food production, including zoonoses. The latter will also be addressed by developing tools for monitoring, prevention and control, by underpinning and applied research on vaccines and diagnostics, studying the ecology of known or emerging infectious agents and other threats, including malicious acts, and impacts of different farming systems and climate. New knowledge for the safe disposal of animal waste and improved management of by-products will also be developed.

KBBE.2013.1.3-01: Emerging viral vector borne diseases

Call: FP7-KBBE-2013-7 – single stage

Profound environmental modifications such as climate change and pan-societal globalisation are increasing the risk of food animal diseases emerging in new locations with greater frequency, in particular vector borne diseases. These diseases have a major impact not only on animal health but also on global food production, and trade. Some of these emerging diseases may also threaten human health. Reactive approaches are economical in the short term but may be far more expensive in the long run and may lead to irreparable consequences, such as enzootic establishment of previously exotic diseases. In consequence we need to get further knowledge on these emerging diseases and their potential spread all over Europe.

The project should develop knowledge on the emerging diseases and analyse surveillance systems in order to improve epidemiological surveillance strategies in domestic and wild species. It will also focus on disease detection and control tools. The role of vectors' ecology in virus transmission should be studied. The project should address diseases like Rift Valley Fever (RVF) and other newly revealed diseases, such as Schmallenberg virus. Participation of relevant third countries, in particular those where disease represents a major threat to the EU, as well as those more active in research, and international organisations should be sought. The project should build on results and experience from existing networks in this field.

Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs).

One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 3 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 20 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: Prevention and minimising, mitigating the impacts of these diseases.

KBBE.2013.1.3-02: Sustainable apiculture and conservation of honey bee genetic diversity

Call: FP7-KBBE-2013-7 – single stage

The aim of this topic is to support innovative research on a) the underlying resistance mechanisms to infectious and parasitic diseases in honey bees and b) maintaining the diversity of endemic honeybee races in Europe. Taking into account the prevailing role of the ectoparasite mite *Varroa destructor* and the associated viruses, the research should focus on the comprehensive understanding of natural resistance mechanisms of honeybees against the mite both as genuine parasite and in its role as virus vector. The research should range from molecular processes to population wide epidemiology and develop strategies for sustainable control and integrated management of *Varroa* based on the disruption of the mite behaviour and/or physiology with the aim, on the long-term, of a therapy free approach.

The research will combine expertise in molecular genomics and transcriptomics, molecular physiology, behavioural sciences, parasitology and virology, as well as apicultural and developmental extension. The role of environmental effects on bee populations may also be considered. At the same time the research will explore how genetic diversity of honeybees could be protected by integrating biological, economical and social components and how it can be utilised to enable sustainable apiculture production and preserve the pollinator role of bees in agriculture.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: Although *V. destructor* is not the sole cause of each and every colony loss, it has been repeatedly shown to be a key factor in colony death. Removing the mite from the complex equation of honeybee health removes the pressure on the honeybee's extensive natural defence against other health challenges. Using sustainable control/management strategies of *Varroa* should ease beekeepers' concerns and could help to re-establish wild and feral bee populations, thus protecting pollination-dependent agriculture, ensuring both food security and pollination services in natural ecosystems. Combining this research together with honey bee genomic diversity should allow the identification of future threats and emerging diseases like what happened with the Colony Collapse Disorder (CCD) and to enable agriculture to deal with future environmental changes. It will help to integrate beekeepers into stock improvement programmes instead of relying on a few sources of queen bees. Economically this approach will provide potential for new income through pollination services and selected bee stock marketing.

KBBE.2013.1.3-03: Sustainable animal production: an integrated and multi-factorial approach

Call: FP7-KBBE-2013-7 – single stage

The aim of this topic is to contribute to our understanding of the multi-factorial dimension (infectious agents, genetics, nutrition, and management factors) of animal pathologies linked to the intensification of production, so-called 'production diseases' and to help to provide effective control strategies to reduce the impact on animal welfare, including health.

The research will target at least pig and poultry pathologies like for example neo-natal mortality, gut and respiratory disorders, leg disorders(s), metabolic disorders etc. It will consider the various aspects of the production system: breeding-genomics, feeding, animal health parameters, animal-based welfare indicators, bio-security and hygiene, and husbandry practices. Socio-economic aspects should be carefully analysed with the impact on the costs and efficiency of production and in particular, those related to welfare improvement and reduced use of antibiotics. The approach should target intensive farming systems where 'production diseases' are likely to be more prevalent. The project should include training and dissemination activities.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs). One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 20 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: Better understanding of the various factors involved in 'production diseases' in pigs and poultry will help to propose adequate and effective multi-factorial control strategies. Economic analysis of the strategies proposed will help to increase competitiveness of the livestock industry. In addition, a sustainable management of livestock production will contribute to the production of better quality products in a welfare friendly approach that will match consumers' expectations. Therefore the project will provide insights into the resilience of livestock farming systems, taking into account health, welfare and economics.

KBBE.2013.1.3-04: Coordination of research between EU and China on major infectious diseases of animals and zoonoses

Call: FP7-KBBE-2013-7 – single stage

There is common concern that globalisation of food production, including meat, milk and eggs, animal infectious diseases have the potential for very rapid spread irrespective of national borders, causing serious socio-economic and possibly public health consequences. International trade of animal product is constantly increasing. China is a major player in livestock with half of the world swine industry together with an intensive poultry production and a growing cattle industry.

An intensive co-ordination of research activities from the EU and China in the field of animal disease will improve scientific collaborations for the benefit of food safety and food security. The scope of this co-ordinated action is to link the research activities carried out on the one side by the European research programmes (EU Framework Programmes and EU Member States' national programmes including those involving international partners) and, on the other, by related research programmes coordinated by China national institutions, e.g. Chinese Academy of Agricultural Sciences (CAAS). The areas targeted would focus on major infectious diseases, including zoonoses, affecting poultry, pigs and cattle.

The project will ensure a wide-range networking of the relevant scientific communities and stakeholders and the systematic establishment of linkages between the ongoing research and innovation projects from the EU and China. Co-ordination of activities from both sides could include a combination of i) broad networking of the respective scientific communities (via meetings, workshops on diagnosis methods and epidemiological control tools, etc); ii) twinning of large sets of research projects/consortia from the counterparts' programmes, with meetings and exchanges of information, data, materials and methods; iii) short-term

exchanges/visits and training of scientists and researchers (in particular young scientists and researchers), iv) dissemination of results (meetings, exchanges of information by web-conference, etc).

This action will provide a long term vision on future common research activities and will contribute to the international policies of the EU. Furthermore, it should also lead to a coordinated planning of relevant future research initiatives.

The China Academy of Agricultural Sciences (CAAS) intends to support or carry out mirroring and complementary actions. The systematic cooperation with these complementary activities should be reflected in the proposal. This will be considered in the evaluation of the proposal.

Funding scheme: Coordination and Support action (coordinating action).

One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 1 000 000 per proposal.
- Minimum number of participants: 3 independent legal entities from different Member States or Associated Countries and 1 from China.

Expected impact: A wide co-ordination of research activities in this area from the EU and China, which are both major players in these fields, will scale-up EU-China collaboration, in line with the EU-China Science and Technology (S&T) co-operation agreement. The project will ensure a wide-range networking of the relevant scientific communities and stakeholders and the systematic establishment of linkages between on-going animal health research, training programmes and innovation projects in the veterinary field from the EU and China. The project will also improve training opportunities for EU researchers, especially young generation of both sides.

KBBE.2013.1.3-05: Ecology of drug resistant bacteria and transfer of antimicrobial resistance throughout the food chain

Call: FP7-KBBE-2013-7 – single stage

The increasing resistance to antimicrobial drugs has become a major threat to human and animal health worldwide. Inappropriate use of antimicrobial substances has favoured the emergence and spread of resistant micro-organisms. This has limited the therapeutic value of these drugs, resulting in difficult to treat infections, extra suffering, mortality and cost. Antimicrobial resistance can spread to humans and animals (terrestrial and aquatic) via direct or indirect contact, consumed food/feed and through the environment. Transferable resistance determinants are of particular concern in this respect. Therefore, there is a need to analyse the epidemiology and mechanisms of emergence and spread of antimicrobial resistance. Whilst the project should mainly focus on the role of the total food chain as reservoir and disseminator of antimicrobial resistance, it should also consider other relevant transmission pathways (e.g. environment, wildlife, companion animals, humans). Research should include surveillance of resistant bacteria in animals, foodstuffs and the environment. In addition, it should identify risk factors and propose key actions to reduce emergence and spread of antimicrobial resistance throughout the food chain. Usage of antimicrobial substances will be correlated with occurrence of bacteria with antimicrobial resistance in the food chain. Research should assess the animal health, animal welfare, food safety and economic impacts of antimicrobial resistance in the food chain. The project should evaluate the contribution of the food chain to the spread of antimicrobial resistance in humans. It should also address as far as possible the environmental impact.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: The generated knowledge would allow evaluating animal health, animal welfare, food safety and economic impacts of antimicrobial resistance in the total food chain, and minimising the transfer and spread of antimicrobial resistance. The European added value lies in contributing to the EU policies on combating antimicrobial resistance, strengthening the competitiveness of European food producers, improving food safety and enhancing consumer trust.

Area 2.1.4 Socio-economic research and support to policies

Providing the tools needed by policy makers and other actors to support the implementation of relevant strategies, policies and legislation and in particular to support the building of the European Knowledge Based Bio-Economy (KBBE) and the needs of rural and coastal development. The Common Fisheries Policy and the new European Maritime Policy will be supported through a whole ecosystem approach for the harvesting and the farming of marine resources. Research for all policies, including the Common Agricultural Policy, will include socio-economic studies and cost-benefit analysis, comparative investigations of different farming systems including multifunctional ones, cost-effective fisheries management systems, the rearing of non-food animals, interactions with forestry and studies to improve rural and coastal livelihoods.

KBBE.2013.1.4-01: Sustainable Forest Management and Multifunctional Forestry – ERANET

Call: FP7-ERANET-2013-RTD

Sustainable forest management (SFM) and multifunctional forestry are vital to maintain the environmental, social, cultural and economic functions of forests. However, European research in these fields is still fragmented and it is therefore needed to strengthen co-operation and coordination of research activities carried out at regional or national level.

The ERA-NET will aim at establishing joint research efforts between the involved countries. This should include creation of mutual understanding on SFM and multifunctional forestry, providing a solid basis for policy decisions. The ERA-NET will help addressing the challenges of the Europe 2020 Strategy and of the new EU Forestry Strategy. Research will be innovative and integrated, addressing forestry in a broader intersectoral way.

The ERA-NET will seek synergies with other relevant initiatives such as the newly established FORESTERRA ERA-NET and activities of the future ERA-NET+ (topic KBBE.2012.1.2-08: Innovation in the forest-based sector for increasing resource efficiency and tackling climate change with competitive customer solutions).

Funding scheme: Coordination and Support Action (coordinating action).

Eligibility and evaluation criteria: please refer to Annex 4 of the Cooperation Work Programme including the Call Fiche "FP7-ERANET-2013-RTD".

Expected impact: The ERA-NET should: (i) provide mapping of ongoing research activities, (ii) Improve coordination and reduce overlapping between national and EU funding in relevant fields of research; (iii) achieve critical mass and ensure better use of limited resources in fields of mutual interests; (iv) share good practices in implementing research programmes; (v) promote transnational collaborations and new knowledge generation and innovation; (vi) mobilise SMEs in the transnational projects to enhance innovation; (vii)

establish a network of research activities carried out at national and regional level, including a mutual opening of national and regional research programmes, and vii) prepare and implement transnational joint calls.

KBBE.2013.1.4-02: Integrated Pest Management (IPM) - ERANET

Call: FP7-ERANET-2013-RTD

European Union Member States are currently in the process of developing research programmes designed to support the National Action Plans and implement Integrated Pest Management practices required by Directive 2009/128/EC. The demanding legislative framework (Sustainable Use Directive, Regulation on Placing of Plant Protection Products on the market, Water Framework Directive) increases the need for further research and coordination for the development and mainstream application of IPM. It also reduces the availability of Plant Protection Products, thereby impacting in particular on the 'minor uses' sector mainly in fruits and vegetables, seeds, flowers and other plants which depend heavily on tailor made pesticides for protection.

The proposed ERA-NET will address the above mentioned issues and also deal with pesticide risk assessment for 'minor uses' along with IPM-type solutions to reduce dependency on pesticides for speciality or 'minor use' crops. It should aim at ensuring better communication between the various actors in this area, coordination with other initiatives and establishment of interactions. It should create synergies and economies of scale and ensure a higher level of implementation of Integrated Pest Management among European farmers.

Funding scheme: Coordination and Support Action (coordinating action).

Eligibility and evaluation criteria: please refer to Annex 4 of the Cooperation Work Programme including the Call Fiche "FP7-ERANET-2013-RTD".

Expected impact: The ERA-NET should: (i) provide mapping of ongoing research activities, (ii) Improve coordination and reduce overlapping between national and EU funding in relevant fields of research; (iii) achieve critical mass and ensure better use of limited resources in fields of mutual interests; (iv) share good practices in implementing research programmes; (v) promote transnational collaborations and new knowledge generation and innovation; (vi) mobilise SMEs in the transnational projects to enhance innovation; (vii) establish a network of research activities carried out at national and regional level, including a mutual opening of national and regional research programmes, and vii) prepare and implement transnational joint calls.

KBBE.2013.1.4-03: Mediterranean agriculture - ERANET

Call: FP7-ERANET-2013-RTD

[in coordination with relevant actions foreseen by Work Programme 2013 of the INCO Capacities Programme]

Co-operation between European research funding bodies in the Mediterranean area started with a dedicated collaborative working group set up by the Standing Committee on Agricultural Research (SCAR). The ARIMNet ERA-NET on coordination of Agricultural Research in the Mediterranean stemmed from this working group and will finish by end 2012. In that context, the countries of the Mediterranean basin identified common issues in relation to agriculture, mainly as regards the use and management of natural resources, such as soil and water, crop protection and threats to the security and sustainability of agricultural production resulting from climate change.

A stronger scientific cooperation between EU members and Mediterranean Partner Countries (MPC) has been triggered and deserves to be continued, deepened and enlarged (in terms of topics –e.g. food security- and partnership). The link between research and innovation should

be enhanced and an articulation with the Joint Programming Initiatives (JPIs) (e.g. FACCE) should be considered.

This project is expected to deepen the coordination of national research activities through a scientific research agenda shared among the countries of the Mediterranean area.

During the negotiation and implementation phase, complementarities with actions that will be selected under the ERA-NET call targeting the Mediterranean Partner Countries to be launched in the Work Programme 2013 of the INCO Capacities Programme should be ensured.

Funding scheme: Coordination and Support Action (coordinating action).

Eligibility and evaluation criteria: please refer to Annex 4 of the Cooperation Work Programme including the Call Fiche "FP7-ERANET-2013-RTD".

Expected impact: The ERA-NET should: (i) provide mapping of ongoing research activities, (ii) Improve coordination and reduce overlapping between national and EU funding in relevant fields of research; (iii) achieve critical mass and ensure better use of limited resources in fields of mutual interests; (iv) share good practices in implementing research programmes; (v) promote transnational collaborations and new knowledge generation and innovation; (vi) mobilise SMEs in the transnational projects to enhance innovation; (vii) establish a network of research activities carried out at national and regional level, including a mutual opening of national and regional research programmes, and (viii) prepare and implement transnational joint calls.

KBBE.2013.1.4-04: Information and Communication Technologies (ICT) and robotics for sustainable agriculture - ERANET

Call: FP7-ERANET-2013-RTD

There is a growing worldwide need to integrate modern agricultural engineering tools for enabling agriculture to meet the global demand for food, feed and bio-based products, to reduce the environmental footprint of agriculture, to respond to customers demand for healthy food and to combine precision livestock farming with high animal welfare standards.

The aim of this ERA-NET is to link-up efficiently national research programmes in ICT and robotics for sustainable agriculture. In consultation with relevant Technology Platforms (TP), like Manufacture-Agricultural Engineering Technologies, TP Organics and others, a common European research agenda based on shared priorities will be established and updated. The ERA-NET will build on previous mapping to enhance the coordination of European Research capacity.

Funding scheme: Coordination and Support Action (coordinating action).

Eligibility and evaluation criteria: please refer to Annex 4 of the Cooperation Work Programme including the Call Fiche "FP7-ERANET-2013-RTD".

Expected impact: The ERA-NET should: (i) provide mapping of ongoing research activities, (ii) Improve coordination and reduce overlapping between national and EU funding in relevant fields of research; (iii) achieve critical mass and ensure better use of limited resources in fields of mutual interests; (iv) share good practices in implementing research programmes; (v) promote transnational collaborations and new knowledge generation and innovation; (vi) mobilise SMEs in the transnational projects to enhance innovation; (vii) establish a network of research activities carried out at national and regional level, including a mutual opening of national and regional research programmes, and (viii) prepare and implement transnational joint calls.

KBBE.2013.1.4-05: Climate smart agriculture: adaptation of agricultural systems in Europe - ERANET+

Call: FP7-ERANET-2013-RTD

The overall aim of the action is to allow proposing Member States to successfully implement Joint Calls thus further increasing the level of coordination between European research funding bodies in the area of Agriculture, Food Security and Climate Change. The action would seek complementarities between national activities and pooling resources to undertake joint funding of transnational research projects. In setting priorities for the action's activities, - implementing the priorities defined by , the current Joint Programming Initiative on Agriculture, Food Security and Climate Change (JPI FACCE) – JPI activities strategy should be sought, as well as, coordination and synergy with existing ERA-NETs active in this area.

The emphasis of this ERA-NET+ will be on adaptation of agricultural systems in Europe to climate change.

Climate smart agriculture has been defined as agriculture that sustainably increases productivity and resilience (adaptation), reduces greenhouse gases (mitigation), and enhances food security and development (FAO, 2010). In order to stabilize outputs and income, production systems should become more resilient, i.e. more capable of performing well in the face of disruptive climatic events. Enhancing the capacity to manage climate risk is also a core adaptation strategy. There are many region- or situation-specific climate risk management options (e.g., crop and livestock diversification) that may also have adaptation value.

Under more severe climate changes planned adaptation is needed. Planned adaptation in agriculture will require a large coordinated international research effort to develop seeds and breeds adapted to the uncharted climatic conditions of the end of this century and to design resilient and eco-efficient crop and livestock systems, while ensuring the dynamic conservation of soil, water and genetic resources and taking into account socio-economic aspects of adaptation to climate change. More productive and resilient systems may also lead to beneficial side effects in terms of carbon sequestration and reduction of greenhouse gas emissions per unit product and area. In this respect, adaptive interventions will also have mitigating effects, meeting the true challenge of climate smart agriculture. In addition, as shown in a recent study³⁷, the differential effects of climate change through the North-South gradient in Europe should lead to the implementation of specific policies at the regional level. Agro-ecological engineering through the increased use of genetic and species diversity at field and landscape scales and eco-technologies to adapt water management by improved water harvesting, increased water use efficiency and efficient fertilization practices, to monitor and reduce greenhouse gas, to increase and verify soil and biomass carbon stocks will play a key role. A critical research question would be the balance and interactions between genotype, environment and management to achieve climate smart agriculture.

Funding scheme: Coordination and Support Action (coordinating action).

Eligibility and evaluation criteria: please refer to Annex 4 of the Cooperation Work Programme including the Call Fiche "FP7-ERANET-2013-RTD".

Expected impact: The ERA-NET+ will enhance operational coordination of RTD public funding in Europe by implementing transnational joint calls in relevant thematic areas. In addition it will: (i) provide mapping of ongoing research activities, (ii) Improve coordination and reduce overlapping between national and EU funding in relevant fields of research; (iii) achieve critical mass and ensure better use of limited resources in fields of mutual interests; (iv) share good practices in implementing research programmes; (v) promote transnational collaborations and new knowledge generation and innovation; and vi) mobilise SMEs in the transnational projects to enhance innovation; vii) establish a network of research activities carried out at national and regional level, including a mutual opening of national and regional research programmes.

³⁷ <http://mars.jrc.ec.europa.eu/mars/Projects/AVEMAC>

KBBE.2013.1.4-06: Innovative solutions in organic food and agriculture for next generation of food systems seeking synergies between rural development, natural resource management and food security and quality – ERANET+

Call: FP7-ERANET-2013-RTD

The aim of this ERA-NET+ is to pool the necessary financial resources from the participating national (or regional) research programmes and the EU, to launch joint international calls for research, development and innovation in the area of organic agriculture and food.

The main objective of this ERA-NET+ is to support the integration of the knowledge basis and innovation capacity in organic food and farming as a tool to tackle great societal challenges in Europe's agriculture and food systems highlighted in the third Standing Committee on Agricultural Research (SCAR) foresight³⁸ and the Budapest Declaration³⁹. This will be achieved by integrating the research and innovation capacity of the most important stakeholders from research and industry.

The joint transnational calls will allow for a focused and coordinated research and innovation effort covering some of the most important challenges along the organic value chains.

Thematic focusing of this joint transnational calls should be commensurate with the funds available, so as to ensure a reasonable rate of success in the call. Possible areas for testing integrated programme planning and implementation could include for instance the closing of the protein gap in order to secure a healthy diet for the still growing global population or other aspects of high priority. Details on the topics covered by the call will be decided by the participants in due time but should be selected upon consultation with the Commission services concerned.

The selection of thematic areas and call topics should reflect experiences from the on-going research collaboration in Core Organic I & II as well as the Technology Platform (TP) Organics and complement the policy oriented topics in the FAFB work programme.

Funding scheme: Coordination and Support Action (coordinating action).

Eligibility and evaluation criteria: please refer to Annex 4 of the Cooperation Work Programme including the Call Fiche "FP7-ERANET-2013-RTD".

Expected impact: The ERA-NET+ will enhance operational coordination of RTD public funding in Europe by implementing transnational joint calls in relevant thematic areas. In addition it will: (i) provide mapping of ongoing research activities, (ii) Improve coordination and reduce overlapping between national and EU funding in relevant fields of research; (iii) achieve critical mass and ensure better use of limited resources in fields of mutual interests; (iv) share good practices in implementing research programmes; (v) promote transnational collaborations and new knowledge generation and innovation; and (vi) mobilise SMEs in the transnational projects to enhance innovation; (vii) establish a network of research activities carried out at national and regional level, including a mutual opening of national and regional research programmes.

KBBE.2013.1.4-07: Boosting the translation of FP projects' results into innovative applications in the field of agriculture, forestry, fisheries and aquaculture

Call: FP7-KBBE-2013-7 – single stage

The main aim of this topic is to allow building on results from projects funded under EU Framework Programmes (FP5, FP6, FP7) and ERA-Nets in the field of agriculture, forestry, fisheries and aquaculture, to prove the technical and economic viability of methodologies, processes, prototypes, models, technologies etc. – developed under these projects – that offer a potential economic interest but which cannot be commercialised directly. Eligible activities

³⁸ http://ec.europa.eu/research/agriculture/scar/pdf/scar_feg3_final_report_01_02_2011.pdf

³⁹ http://ec.europa.eu/research/agriculture/conference/pdf/budapest_declaration.pdf

(mainly demonstration, although some limited applied RTD activities might be eligible if properly justified) under this topic will focus on specifications, testing and validation of existing results of FP projects for reaching the last development stage before products or processes enter the production and/or the market. Proposals should fit into the overall business and innovation needs of the SMEs involved and should demonstrate clear exploitation potential and economic benefits for them. Applicants should hold the necessary rights to exploit the results and knowledge to be used in their application and the proposals should clearly and convincingly describe how this knowledge/technology will be brought forward enough to reach the stage of innovative application within the duration of the project.

Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs).

Up to six projects may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 1 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 50 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.
- The duration of the proposed project shall be maximum 2 years.

Expected impact: This topic is expected to contribute in tackling the paradox of EU research, i.e. being world leader in producing high level scientific knowledge but underperforming in terms of translation into applications and innovative products and services in Europe. Considering the specificities of the European economic sectors falling under this Activity of the KBBE, this topic is expected to contribute in paving the way from the development of scientific knowledge and technologies to the market by stimulating the development of new patents, dedicated business plans and innovative marketable applications, while contributing in creating economic growth in Europe.

KBBE.2013.1.4-08: Boosting the outreach of research with focus on agricultural and forestry knowledge and innovation systems

Call: FP7-KBBE-2013-7 – single stage

The aim of this topic is to valorise research results from projects funded under EU Framework programmes (e.g. FP5, FP6, FP7, ERA-Nets) and other European trans-national and national projects in the field of agriculture and forestry for integration into farming practices. Many research projects provided excellent results of a general nature but the translation of these results into farming practices needs wrapping up, digesting, developing and dissemination with a sound understanding of regional and local specificities, in particular for enhancing innovation.

The project will comprehensively review relevant research results and existing scientific knowledge from national, international and EU research projects and studies. It should also pay attention to empirical knowledge, make information and knowledge accessible to intermediate and end-users (advisors, farmers, enterprises). The project should summarize and refine results of research projects, with a special interest for innovative and applicable approaches and translate them into ready-to-use information. Proposals should mobilize regional and local agricultural research stations and extension services in a joint effort to screen and translate results and integrate them into agricultural knowledge systems, including demonstration where appropriate (for example private farms with performance data). The project will also stimulate a long term dialogue between scientists, producers and other interested stakeholders. Eventually, the project will contribute to identifying gaps and

prioritising needs for research in support to the agricultural production sector by revealing elements limiting the translation to and take-up by end-users.

The themes for the project would include a wide range of issues relevant for sustainable farming. These could include the areas for innovative action as mentioned in the Commission Communication on the agricultural European Innovation Partnership⁴⁰.

Themes to be covered:

- Crop rotation including soil cover management and integrated pest management
- Eco-system and social services in agriculture and forestry
- Soil management as an integrated agro-ecological system
- Water management in agriculture
- Sustainable integrated supply chain services and tools, innovative farm management
- Recycling and smart use of biomass and food waste, in particular waste generated during primary production

Activities to be carried out in the project:

- Inventory of research results and existing knowledge
- Interaction between end-users and other actors (farmers, advisors, researchers, etc.)
- Translation of the research results into end-user information,
- Integration of feedback on the potential for innovation from practitioners and drawing conclusions for further research
- Where applications of research results are within reach: refining and testing in view of proving technical and economical viability of the innovative solutions

The participation of regional or local agricultural research stations, extension services, farmers or other relevant SMEs will be positively evaluated. The proposal should build strong links with relevant R&D projects at EU, national or regional level and will link to the Standing Committee on Agricultural Research (SCAR). A preliminary exploration of possible tools to communicate this information to end-users should be added (wikis, organic e-prints etc.), based on the analysis of the characteristics of prominent examples in the EU and other leading agricultural nations.

Funding scheme: Collaborative Project (small or medium-scale focused research project)

Up to one project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 3 000 000 per proposal.

Expected impact: This topic is expected to contribute to turn the role of EU research as a world leader in producing high level scientific knowledge into impact in terms of stimulating application and innovation. This topic will contribute to close the innovation gap between research and farming practice and prepare for the activities of the European Innovation Partnership. New approaches will arrive faster on the ground, and the specificities of practical farming and forest management will be integrated into scientific activities. The topic is expected to contribute to enhancing sustainable agricultural production, while managing natural resources efficiently in line with environmental requirements. Relevant innovations will be implemented at the necessary scale, and relevant research fields will receive the attention they require. The topic should pave the way for new concepts to mobilise science to increase public goods provision by agriculture. It should provide the user perspective to assess research results.

KBBE.2013.1.4-09: Improving the capacity of agro-meteorological crop modelling to integrate climatic variability and extreme weather events

⁴⁰ COM(2012) 79 final

Call: FP7-KBBE-2013-7 – single stage

The aim of this topic is to improve food security by improving the modelling of extreme weather events. In the framework of discussions related to food security and to the functioning of markets, whether at EU or world level, the capacity to produce short-term production forecasts is becoming increasingly important. In the EU a capacity to produce yield forecasts on the basis of agro-meteorological models has been developed in the last 20 years. These short-term forecasts are utilised, among others, by the Directorate General for Agriculture and Rural Development as part of its monitoring of agricultural markets. At the world level, agro-meteorological models are important tools to monitor food security and are at the root of early warning systems.

For addressing climate change impacts on global food production, food security and food prices there is a need to better integrate effects of changes in climatic variability and extremes, including heat waves, droughts and floods, into crop model assessments. Previous assessments have failed to account sufficiently for such effects which, given current projections of increases in some extreme weather phenomena under climate change, may lead to a severe underestimation of yield losses and yield variability under increase of extreme climatic events projected within climate change scenarios.

The project will aim at improving the capacity of agro-meteorological models to project the impact of extreme weather events, both in the short term and the long term. Extreme events are expected to increase under climate change. The research should aim to assess the capacity and the ability of the existing modelling approaches, both based on deterministic and on stochastic or probabilistic approaches, to address the increase in frequency and impact of climatic shocks or extreme events on crop yield forecasts and crop biomass formation. The project should look at the assessment taking into account crop system diversity by geographic area.

Given the variety of types of extreme events also in other parts of the world, international research cooperation is encouraged. The dissemination of research results and in particular their integration into the yield forecasting system developed by the Joint Research Centre Monitoring Agricultural Resources (MARS)⁴¹ will be positively evaluated.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 2 000 000 per proposal.

Expected impact: Project results are expected to lead in an improvement of the capacity of agro-meteorological models to better deal with extreme events. At the EU level, this is expected to lead to better short-term and medium term forecasts. At world level, project results should contribute to improve food security monitoring and early warning systems.

KBBE.2013.1.4-10: Agriculture and trade development in EU's Eastern Neighbours

Call: FP7-KBBE-2013-7 – single stage

The aim of this topic is to gain a better understanding of the agricultural production potential and the role it could play for Europe and internationally.

Several countries of the Commonwealth of Independent States (CIS) have sizeable agricultural sectors. This does not apply only to Ukraine and Russia which are major players in the arable crop sector on world markets but also other countries such as Moldova which is an important fruit and vegetable and wine producer and exporter.

⁴¹ <http://mars.jrc.ec.europa.eu/>

In a world where long-term food security is an issue –feeding the world population by 2050 – it is important to look at untapped potential for food, feed and biomass. The sheer weight of the agricultural sector in Russia and in Ukraine and the implication for international and EU trade call for a better knowledge and monitoring of current and potential development of their sector. The need for an appropriate knowledge applies obviously to the grain sector, for which Russia and Ukraine are strong competitors on world markets, but extends, for example, to their potential to produce biomass for material and energy use, to the market for certified organic production, to the restructuring of the processing industry and the implications for the future competitiveness of these countries and potential foreign direct investment.

The development of international trade in agriculture of these countries depends upon the dynamics of the sectors but also on their participation in trade agreements. This concerns the EU with which so-called Deep and Comprehensive Free Trade Agreements (DCFTA) are being negotiated and also intra-regional trade with the customs union between Russia, Belarus and Kazakhstan.

The research project will aim at investigating the development of the agriculture, food and non-food sectors and of the policies implemented in Armenia, Azerbaijan, Georgia, Kazakhstan, Moldova, Russia, Belarus and Ukraine. The investigation will cover in full details the major sectors in these countries. More specifically, it will address biomass availability and possible trade opportunities for the European bioeconomy. All policies with a bearing on the development of the sector will be analysed (the various elements of agricultural policy, trade policy, industrial policy, macro-economic policy, etc.). In addition, the policy analysis will extend to all areas which are important for trade and business development, such as: Sanitary and Phytosanitary (SPS) standards, tax policy, Foreign Direct Investment (FDI), Intellectual Property Rights (IPR), contract enforcement, business development service providers etc. The findings of the policy analysis relevant for ERAWATCH will be made available in a form suitable for integration. etc. In order to provide insights on medium-term possible development, modelling of the sector in the major countries (in particular Ukraine and Russia) on the basis of partial equilibrium model will be explored.

Regarding trade in agriculture and food products, the potential/actual impact of the DCFTAs with the EU will be analysed through economic modelling. The impact of the Customs Union between Belarus, Russia and Kazakhstan on the investment climate as well as bilateral trade relations with the EU will be analysed also.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 2 000 000 per proposal.

Expected impact: The project will provide useful insights in sectoral and policy developments in the concerned countries. It will also deliver simulations / impacts of bilateral trade agreements. This will entail better informed bilateral trade relations between these countries and the EU.

KBBE.2013.1.4-11: Measurement of research impact in European agriculture

Call: FP7-KBBE-2013-7 – single stage

With the recent proposals of the Common Agricultural Policy (CAP) and Horizon 2020 a renewed emphasis will be put on agricultural research and innovation. Few studies exist and suggest a high return on investment on European, national and regional level. Systematic research and data are needed to accompany this new policy approach.

The aim of this topic is to better target public agricultural research spending in the EU. It is estimated that public research dedicated to the agricultural sector amounts to above EUR 3 billion per year in the EU (Eurostat, Government budget appropriations or outlays on R&D (GBAORD) data). In addition, the private sector invests sizeable amounts, although there are no statistical data dealing with private investments in research.

The assessment of the impact of research in the development of the sector is arduous. The major works (done in particular by Alston and Pardey) focus on productivity growth. Apart from the difficulty of attribution of productivity growth to research, another difficulty of measuring the impact in terms of productivity is that a large body of research is meant to achieve other objectives than increasing productivity (increase sustainability, etc).

Investigate the public and private effort in research in the agriculture and related sectors and develop tools to measure the impact of agriculture research: impact on productivity but on other research objectives.

Methodology:

- Analysis of current research expenses both public and private (trends, sources, objectives) in agriculture;

- Economic modelling to measure impact on productivity and other indicators, time lags, etc. Use of different statistical sources should be explored, including, EU farm surveys (structural survey, Farm Accountancy Data Network).

- Case studies or other methods for the measurement of impacts taking into account such aspects as: process (programming, stability of funding, structures, public-private partnership, and coordination), distinction between fundamental research and applied research, factors of success of results implementation on the ground level.

The project will provide recommendations regarding the improvement of the delivery of research.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 2 000 000 per proposal.

Expected impact: The project will deliver a thorough picture of agricultural research in the EU. It will deliver tools enabling to better evaluate short-term and long-term impacts of research and recommendations. These elements will allow policy makers and other stakeholders at Member State and EU levels to better design and implement research programmes in agriculture.

KBBE.2013.1.4-12: Support to agricultural policy - Establishing and testing farm-level indicators

Call: FP7-KBBE-2013-7 – single stage

The aim of this topic is to contribute to the development of indicators for the monitoring and evaluation of the CAP in order to achieve better targeting of policy measures. Since its inception, the CAP has had to cater for an ever increasing range of objectives. The original market stabilisation and income support goals have been augmented by including environmental sustainability and the contribution of agriculture to climate change adaptation and mitigation. With the CAP post-2013, the aim will be to better align the policy to the objectives and targets of the Europe 2020 Framework such as innovation or resource efficiency.

It will therefore be important to obtain an in-depth picture of the impact of the CAP at farm level. The scope of issues to be covered imply to work on the basis of data collected with a

representative sample of farms across the EU and Member States. Therefore, there is a need for the establishment of a data infrastructure of the CAP on the basis of farm-level indicators. For reasons of coherence and synergies, this initiative will have strong links with Farm Accountancy Data Network (FADN) and include the testing of farm level indicators.

Research questions will be the following:

- Indicators, data and proxies: address methodological questions on relevant indicators and data (including administrative data, farm structure survey, census data), including methodologies for determination of net impacts and establishment of counterfactuals for measuring the impact of the CAP at farm level across a large array of fields, including farm economics, environmental sustainability (including impact of agri-environmental measures, greening of direct payments, Good Agricultural and Environmental Conditions (GAEC), Natura 2000, High Nature Value areas, etc.), knowledge transfer and innovation and other societal needs and in relation to the range of CAP instruments (e.g. rural development measures, direct payments, market measures, etc.). The methodology should allow analysing the jointness between the different objectives of the CAP at farm level (e.g. economic impact of environmental objectives of the CAP). The scheme will monitor at least the following variables at farm level: economics (income, productivity, input/output terms of trade), environment (biodiversity, soil, emissions and water), and social (employment).
- Develop an approach suited to contribute to the monitoring and evaluation of the relevant policies taking into account existing relevant initiatives and methodologies (e.g. agri-environmental indicators, the new Common Monitoring and Evaluation Framework for the CAP, reporting and evaluations for rural development, Organisation for Economic Co-operation and Development (OECD) indicators, EU biodiversity strategy indicators, "Indicators of Success" of UK stewardship scheme, etc.);
- Establish a pilot network of farms (representative of farm diversity at EU level), well suited for the gathering of data on the basis of farm-level indicators with a view to test indicators and methodologies.
- Prepare the ground for follow-up activities to be implemented by the European Commission (feasibility of different options, stratification of sample, etc.) within a reasonable timeframe.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 3 000 000 per proposal.

Expected impact: The project will contribute in supporting the implementation of the CAP. The project will (a) deliver a thorough picture of agricultural research in the EU. It will deliver tools enabling to better evaluate short-term and long-term impacts of research and recommendations. These elements will allow policy makers and other stakeholders at Member State and EU levels to better design and implement research programmes in agriculture. The project (b) will also provide significant contribution to the field of policy assessment relevant to the CAP but also to other EU and national policies (e.g. environmental policies) in order to achieve better targeting of policy measures. Lessons learned and recommendations to be utilised for the establishment of an operational EU-wide system at the European Commission.

ENERGY.2013.3.7.1: Support to the sustainable delivery of non-food biomass feedstock at local, regional and pan-European level

Call: FP7-ENERGY-2013-1

This topic is implemented jointly by the ENERGY and KBBE Theme but only open in call FP7-ENERGY-2013-1

In the context of the development of the Bioeconomy, the sustainable and reliable supply of non-food biomass feedstock (i.e. lignocellulosic biomass: agricultural and forestry residues and energy crops) is a critical success factor for the long-term perspective of biomass-based technologies to produce bioenergy and other bio-based products⁴² on a large scale, while not competing with the food market and also benefiting the local rural communities.

The objectives of this project are to develop Strategies, Roadmaps and Tools (SRT) in support of decision-making at local, regional and Pan-European level. This will involve economic, social, environmental and logistics research building on most relevant data and projects⁴³.

The development of these SRT will have to confront and make use of a large number of available information including:

- Geographical and environmental (e.g. soil, water, climate, protected areas);
- Agronomical (e.g. best available and identified plant/tree varieties, agricultural and forestry practices including effect of biomass extraction on carbon cycle);
- Industrial (e.g. best available pre-treatment and conversion processes, considering also relevant pilot and demo projects⁴⁴);
- Logistical (e.g. hubs and transportation routes);
- Economic and regulatory (e.g. CAP, RES Directive, strategies for rural and regional development, national support schemes, workforce).

Due consideration will be given to the development of small-scale plants suitable for decentralized operation with associated benefits to rural communities besides the centralized large-scale units involving long distance biomass transport.

The SRT will be offered to Member States, Associated and neighbouring countries in a sufficient number of regions for testing and validation, including the necessary ex-ante economic, social and environmental impact analysis.

The interaction and possible complementarities between these regional SRT at Pan-European level will be investigated. This could lead to suggest optimal flows of biomass feedstock to all uses and the best possible organisation of biomass pre-treatment and conversion plants at interregional levels.

Ultimately, the most promising logistic supply-chains at local, regional and pan-European levels will be further elaborated into a set of implementation plans. These plans should present notably the infrastructures needed, transport modes and flows of feedstock.

The South East European and East Neighbourhood countries shall be considered as part of this Pan-European approach. Appropriate links will be made with relevant programmes and actions, notably in the context of the EU Agricultural, Environmental, Regional, Enlargement and Neighbourhood policies.

Once validated, most, if not all, SRT material shall be made public in a computerized and easy to use format with an adequate information campaign associated to it in the perspective of possibly developing it as an interactive and updatable reference tool.

Funding scheme: Collaborative Project

Expected impact: It is expected that the SRT developed would usefully support the local, regional and national authorities in their decisions for planning and strategy implementation with regard to the non-food use of biomass feedstock. It shall bring substantial environmental,

⁴² In this context, the term “bio-based product” means a commercial or industrial product (other than food or feed) that is composed, in whole or in significant part, of biological products or renewable domestic agricultural or forestry materials or an intermediate feedstock.

⁴³ E.g. BEE, CEUBIOM, Biomass futures, Biomap, Biomass Trade Centres, BEn, Wood Heat Solutions, BioEnerGis, CAPRI, etc.

⁴⁴ E.g. Sector, Bioboost

economic and social benefits as opposed to the current largely individual decision-making by most of the concerned actors. The SRT would also help industries involved in logistics, harvesting, pre-treatment and conversion of biomass for their investment decisions regarding technology, plant location, transport means and industrial operation more generally.

Additional information:

- Up to one project may be funded which should encompass participation from a sufficient number of countries to ensure Pan-European dimension. This will be considered during the evaluation under the 'Implementation' criterion.
- The proposals should clearly identify the links with other relevant projects, how they plan to use synergies and avoid duplication.
- The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

Area 2.1.5 "The Ocean of Tomorrow 2013" call - Joining research forces to meet challenges in ocean management

The EU Strategy for Marine and Maritime Research⁴⁵ supports the EU integrated maritime policy's objective of a thriving and sustainable maritime economy. It is a key component in reconciling the growth of maritime activities with environmental sustainability and thus it contributes to the 'Europe 2020' goal of smart, inclusive and sustainable growth for Europe. In this context, "The Ocean of Tomorrow 2013" calls for proposals aim to foster multidisciplinary approaches and cross-fertilisation between various scientific disciplines and economic sectors on key cross-cutting marine and maritime challenges.

"The Ocean of Tomorrow 2013" third cross-thematic call will focus on marine technologies. The development of competitive and innovative marine technologies is necessary to assess and monitor the good environmental status of the seas, monitor current and new activities and contribute to their sustainable operation. "The Ocean of Tomorrow 2013" call will therefore aim at pooling the efforts of stakeholders from various disciplines and sectors in order to develop innovative marine technologies for a wide range of applications.

Three key areas will be tackled: sensing technologies that are necessary to improve reliable measurements of key parameters in the sea, new materials that can avoid bio-fouling on mobile and stationary structures, and innovative transport and deployment systems for the energy sector.

The call will be implemented jointly between Theme 2 "Food, Agriculture and Fisheries, and Biotechnology" (FAFB), Theme 4 "Nanosciences, Nanotechnologies, Materials and new Production Technologies" (NMP); Theme 5 "Energy", Theme 6 "Environment (including climate change)" and Theme 7 "Transport (including Aeronautics)".

"The Ocean of Tomorrow 2013" call fiche with all relevant information can be found in the Work programme of Theme 2 " Food, Agriculture, Fisheries and Biotechnology" (FAFB), as well as on the Participant Portal under the call page FP7-OCEAN-2013.

OCEAN 2013.1 – Biosensors for real time monitoring of biohazard and man made chemical contaminants in the marine environment

⁴⁵ COM (2008) 534 final of 3.9.2008 - Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: "A European Strategy for Marine and Maritime Research: A coherent European Research Area framework in support of a sustainable use of oceans and seas".

Call: FP7-OCEAN-2013

Due to growing concerns about the health of the oceans and their capacity to continue to provide resources, goods and services as well as associated risks to the human health, there is an increasing demand for real-time monitoring of the environmental status of marine water quality and the provision of early warning systems. Real-time in situ monitoring of marine chemical contaminants (including emerging pollutants, biohazards e.g. algal toxins) is of utmost importance for the sustainable management and exploitation of the seas and their resources.

Technology wise, marine biosensors have the potential to offer unique features for highly specific and precise measurements, including under multi-stressor conditions, by combining technological elements (including nanotechnologies) and bio-receptors in a single measurement device. Thus they could open new avenues to respond to the growing need for accurate real time monitoring of the quality of sea water and marine ecosystems to support relevant EU legislations such as the Marine Strategy Framework Directive (MSFD)⁴⁶.

Based on most recent knowledge on genomics and physiology as well as on materials, nanotechnology, information technologies and relevant existing detection/monitoring technologies, the research under this topic should aim at developing innovative real-time, in situ biosensors, taking advantage of nanotechnology when applicable. These sensors should target the detection and monitoring of high impact and presently difficult to measure emerging pollutants and other substances, such as algal toxins and their producers, synthetic organics, herbicides/pesticides and persistent organic pollutants (POP), including polycyclic aromatic hydrocarbons (PAH) and should enable early diagnosis of deterioration of the environmental status of the marine waters in multi-stressor conditions.

The proposals should include a test phase to demonstrate the potential of these biosensor(s) for in situ environmental and/or aquaculture related applications. Measurement devices should show ability to compete with/complement non real time alternatives and provide faster, less expensive, and less time-consuming measurements than the currently available instrumental analytical methods. A proof of concept in terms of product and/or process should be delivered within the project demonstrating industrial manufacturability.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

Funding scheme: Collaborative project

Several projects may be funded within the total budget of the topic (EUR 15 000 000).

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 25% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected impact: New biosensors in the field of marine environmental monitoring will:

⁴⁶ Directive 2008/56/EC of the European Parliament and of the Council establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), OJ L 164 of 25 June 2008.

- Enable early detection and more effective monitoring of the marine environment and its status and implementation of appropriate management actions in line with the Marine Strategy Framework Directive (MSFD);
- Improve sustainable management and exploitation of marine resources (such as fisheries and aquaculture) in particular the monitoring of quality of shellfish waters and minimise risks to human health;
- Provide competitive advantage and leadership to European industry, for example within the fields of biotechnology, sensor development, diagnostic technologies and nanotechnology.

OCEAN 2013.2 - Innovative multifunctional sensors for in-situ monitoring of marine environment and related maritime activities

Call: FP7-OCEAN-2013

There is an urgent need to improve the in-situ component of the ocean observing systems to achieve an appropriate and comprehensive understanding of the functioning of the marine environment at different geographic, temporal scales and the monitoring of marine and maritime activities to ensure their sustainable development. As commercially available sensors tend to be too large, expensive, and power-hungry for widespread use, reducing the cost for acquisition of data is a key priority in order to implement EU legislations such as the Marine Strategy Framework Directive (MSFD), the Common Fisheries Policy CFP), support international initiatives such as the Global Ocean Observing System (GOOS) and the Global Earth Observation System of System (GEOSS).

In this context the topic seeks to develop robust, easily usable across multiples platforms, cost effective multifunctional sensors and their packages that provide reliable in-situ measurements of key parameters. Research and demonstration activities under this topic shall address in a comprehensive manner all the following aspects:

1/ Developing cost-effective sensors suitable for large-scale production, taking advantage of "new generation" technologies such as within the fields of miniaturisation, communication, positioning systems, disposable technologies, and IT tools, software, energy storage and usage.

2/ Sensors should be compact, autonomous multifunctional integrated packages that could be deployed using free floating devices or, buoys, platforms, or ships of opportunities including fishing vessels. The sensors must be developed as precompetitive prototypes and field tested in close cooperation with stakeholders such as sensor designers, SME's, managers of monitoring/observing systems, marine industry e.g fishermen and end-users. An essential part of this topic will be to ensure technology transfer through an integrated approach, bridging between laboratory testing and commercially viable product.

3/ Addressing data flow issues, including data acquisition, access and retrieval, storage, transmission, standardisation, and pre-processing. The projects should take advantage of the latest web enablement technology for setting up sensors' networks suitable for open access and data sharing.

4/ Making the sensors fully interoperable with existing observing systems and compatible with standard requirement such as the EU Fisheries Data Collection Framework, the Marine Strategy Framework Directive, the INSPIRE directive⁴⁷, the GMES and GOOS/GEOSS initiatives.

⁴⁷ Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

Funding scheme: Collaborative project

Several projects may be funded within the total budget of the topic (EUR 15 000 000).

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 30% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected impact: The projects will:

- Provide a large increase in the temporal and geographic coverage from in-situ marine sensors to enhance the European contribution to Global Monitoring of the Oceans;
- Increase availability of standardised in-situ data that is suitable for integration within key marine observation, modelling and monitoring systems and reduce ocean modelling uncertainty;
- Reduce cost of data collection system in support of fisheries management;
- Advance competitiveness for European Industry's & particularly SME's within the Marine sensing sector;
- Enable better cooperation between key sectors (Manufacturing Industry, ICT, Maritime Industry, Marine Science, Fisheries etc.);
- Support implementation of European Maritime Policies (MSFD, CFP, IMP, etc.);
- Promote new discoveries leading to better understanding of the seas.

OCEAN 2013.3 Innovative antifouling materials for maritime applications

Call: FP7-OCEAN-2013

Biofouling is a major concern for mobile (e.g. ships) and stationary (e.g. aquaculture cages or offshore power generation systems) maritime structures, sensors and equipments. It negatively affects marine and maritime activities by creating a need for regular maintenance, which is costly, might disrupt operations and is potentially polluting. With the purpose of avoiding toxic biocides and heavy metals used in antifouling coatings, novel alternative cost-efficient and environmentally friendly approaches are needed.

The proposals under this topic should focus on developing new, well beyond the state of the art, antifouling materials and should address in an integrative way mobile and stationary maritime applications.

On the basis of a thorough analysis of the state of the art, research could draw on the whole range of antifouling materials e.g. foul release approach, biomimetics, marine biotechnology based coatings, polymers etc. The proposals should include benchmarking of existing materials, technologies and on-going research. In this sense environmental and economic factors, as well as performance, must be duly considered.

Improvement in the understanding of marine biofouling processes, including their relation with biocorrosion, with respect of the developed materials should be an integral part of the proposals. For the resolution of the technological bottlenecks impeding the achievement of well performing final materials and products, applicants are welcome to investigate and

exploit the potential offered by converging technologies such as e.g. materials science and engineering, maritime technology, nanotechnology and biotechnology.

The proposals should include relevant field testing for all the selected applications. Development, improvement and/or standardisation of relevant protocols should be included. Proof of concept in terms of product and/or process should be delivered within the project, excluding commercially usable prototypes (in compliance with European Commission Communication 2006/C323/01), but convincingly proving scalability towards industrial needs.

In the case of marine biotechnology based approaches the issues of supply and the need for the biobased active antifouling compounds to be produced in bulk, as required for final commercial production should be given due consideration.

The proposals should follow a life cycle approach for the new materials and their selected applications also taking into account issues of cost efficiency, effective life span, production, handling, maintenance, environmental impact, ecotoxicological profile and end of life. The proposals should include assessment of the environmental, health and toxicological effects according to REACH⁴⁸, OECD Guidelines for the Testing of Chemicals and/or relevant international standards.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

Funding scheme: Collaborative project

Several projects may be funded within the total budget of the topic (EUR 15 000 000).

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 8 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 25% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected impacts: The projects will:

- Increase efficiency and competitiveness of maritime activities based on mobile and/or stationary maritime structures (transport, aquaculture, fisheries, marine energy) by reducing operation and life-cycle-costs, negative impacts on the marine environment and, in particular for the transport sector, CO₂ emissions;
- Enhance competitiveness and sustainability of the European biotechnology, and/or materials related industry;
- Better understanding/assessment the scope of existing antifouling materials and technologies;
- Contribute to the implementation of EU policies, Environment policy (e.g. the Marine Strategy Framework Directive, REACH), Transport policy (Roadmap to a Single European transport Area – Towards a competitive and resource efficient transport system)

⁴⁸ Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

as well as industrial and innovation policy, such as the EU Strategy for Key Enabling Technologies and the Lead Market Initiative on Bio-based products.

OCEAN 2013.4 Innovative transport and deployment systems for the offshore wind energy sector

Call: FP7-OCEAN-2013

In its Communication "Offshore Wind Energy: Action needed to deliver on the Energy Policy Objectives for 2020 and beyond", the Commission underlines that the exploitable potential of offshore wind by 2020 is likely to be 30-40 GW, and in the 2030 time horizon it could be up to 150 GW.

In 2007, the Energy Wind Association assessed that achieving 40 GW by 2020 will mean that 7,800 turbines of 5 MW need to be built over the next 13 years. Those turbines have to be assembled, transported and installed on sites.

The Strategic Energy Technology Plan (SET-Plan) European Wind Initiative identifies transport and logistic issues as key elements for the deployment and maintenance of offshore wind farms. The TP Wind Strategic Research Agenda also points to research needs both in relation to the cost-effective installation, maintenance, operation and decommissioning of large offshore wind farms as well as to transport, logistics and equipment needs.

In its Communication on Strategic goals and recommendations for the EU's maritime transport policy until 2018, the Commission stresses that maritime transport is an important instrument of the European energy policy. Amongst others offshore servicing vessels are considered as increasingly important aspect for ensuring the well functioning of the energy market.

Research activities under this topic shall address the following aspects:

- Development of innovative and cost-effective deployment strategies for large-scale turbines, including building and testing onshore;
- Elaboration of optimal logistical processes and on-land transport links for large offshore structures;
- Design of novel vessel types and equipment for installation, maintenance and decommissioning and validation at reduced scale;
- Development of safety procedures for installation, operation and maintenance activities, regarding both offshore wind structures and the vessels;
- Improved operations and maintenance including the enhanced role of remote condition monitoring and systems with reduced human intervention;
- Development of new business models at European level for large offshore systems based on integrated life-cycle approaches;
- Development of methods and tools to assess the field performance of offshore wind farms servicing vessels and for optimised service activities in terms of lead time and energy usage.

Proposals are expected to include validation activities at reduced but industrially relevant scale using testing models and where possible tests at real scale using existing infrastructure and equipment, adapting those to validate models and management tools. Tests should also address extreme conditions. The proposal should cover both ground based and floating wind parks.

The multi-disciplinary approach of the research undertaken is essential to address the topic. Knowledge exchange with oil/gas and maritime sectors is expected. These aspects will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

In the framework of the SET-Plan European Industrial Initiatives a specific monitoring and knowledge sharing mechanism will be established under the auspices of the Commission and the selected project will be expected to participate.

Funding Scheme: Collaborative Project

Up to one project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 10 000 000 per proposal.

Expected impact: The project will:

- Contribute to the implementation of the roadmap activity of the European Wind Initiative aiming at supporting offshore take-off in the medium-term;
- Contribute to the development of new niche markets for the European shipbuilding and shipping industries thereby contributing to competitiveness of the sector and to the creation of new jobs.

Activity 2.2 Fork to farm: Food (including seafood), health and well being

The availability of safe, sustainable and healthy food has taken on a new and pressing dimension in the light of the ever-growing global population and increasing environmental and sustainability concerns. The intensifying competition for land, climate change and the shift in dietary patterns across the world, which often includes a significant increase in meat consumption, are rapidly changing the supply/demand scenarios. The need to meet consumers' requirements for high-quality products, healthy diets, affordable prices, fair and equitable relations along the food supply chain and food safety are all part of the challenge. On globalised food markets, food safety, equity and security issues have taken on both an international and an ethical dimension. Sustainability concerns demand more and more that the focus be placed on environmental and societal aspects related to food and food systems – e.g. reducing wastage, energy and water consumption –, and on any negative impact on ecosystems and human societies. The obvious links between food quality, human health, human well-being and the limited capacity of ecosystems to provide goods and services therefore have to be explored with a view to optimising food supply chain systems and making them safe, resilient, efficient and fair. Assessing the links between production systems and food attributes would also help optimise biological and ecological efficiency and financial performance to support productivity, sustainability and competitiveness in the agri-food sector.

The main innovation in this 2013 work programme under this activity is its main focus on sustainability. It paves the way for an integrated approach encompassing, in a single conceptual framework, the total food system supply chain from ecosystems to consumers while addressing all involved in the system, either in their individual dimension or in their interactions. The 2013 work programme comprises two types of activities: (a) research and innovation activities addressing limited but crucial aspects of the food system, e.g. efficiency of bio-resources, water, energy, driving factors in the food system, the need to enhance the competitiveness of the food industry and the need to improve diets and reduce the risk of diet-related diseases; and (b) strategic initiatives aimed at completing and further developing research agendas with a view to research and innovation activities beyond 2013.

In view of the overall objective of increasing the sustainability of the food chain at all its steps, the requirements of citizens for safe, healthy and affordable food are addressed via the nutritional prevention of diet-related diseases and depression – in particular as regards nutrition and the brain –, and by assuring food quality and authenticity. Reducing energy and water consumption and optimising process control contribute to using bio-resources, energy and water more efficiently, making food processing and distribution more sustainable and the food sector more competitive. Food security is assessed against global drivers like climate change. This will be complemented by knowledge transfer to SMEs on traditional foods, and by innovation actions targeting the exploitation of results of former Framework Programme projects.

Area 2.2.1 Consumers

Understanding consumer behaviour and consumer preferences as a major factor in the competitiveness of the food industry and the impact of food on the health, and well-being of the European citizen. The focus will be on consumer perception and attitudes towards food including traditional food, understanding societal and cultural trends, and identifying determinants of food choice and consumer access to food. The research will include the development of data bases on food and nutrition research.

KBBE.2013.2.1-01: Impact of food and nutritional behaviour, lifestyle and the socio-economic environment on depression and proposed remedial actions

Call: FP7-KBBE-2013-7 – single stage

Depression is one of the most prevalent, severe and disabling disorders in the EU and places a heavy burden on individuals and families. It is creating growing challenges for health and social welfare systems and causes high productivity losses for the EU-economy. This project should look into the multi-faceted links between nutrition and depression. It should analyse the two-way relationship between depression and food intake, food composition, nutritional behaviour, and conditions such as anorexia or obesity. The project should build on recent preclinical and clinical findings on food choice respectively nutritional behaviour as response to chronic or psychosocial stress, and also consider relevant epidemiological and cohort studies regarding long-term health effects of different socio-economic environments. It should discuss the findings against the background of industrial, societal and demographic changes and trends including sustainability issues. This should also include the analysis of factors such as the increasing share of consumption of industrially prepared meals (including fast food), the implications for nutritional behaviour of smaller family sizes and increasing number of single households, alongside the increasing social and health inequalities and the ageing of the EU-population. The project should analyse the role of food, nutritional behaviour, body-image perception and anorexia or obesity as risk factors for depression, along with the protective role of certain food composites such as omega-3 fatty acids contained in fish and in certain plants, vitamin D, actives or ingredients to control the glycemic index of the food formula and other nutritional elements. Possible actions in food safety, health and other relevant policy areas should be analysed. Research in this area requires a holistic and innovative approach in close collaboration with many different players and sectors, and participation from emerging economies is encouraged. This call topic is targeted on unipolar depression only. Research on clinical treatment is not included in this call topic.

Funding Scheme: Collaborative Project (large-scale integrating project).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.

Expected impact: 1) The European added value of this topic lies in filling existing gaps in the understanding of the link between nutritional aspects like food intake, food composition, nutritional behaviour, conditions such as anorexia or obesity and unipolar depression against the background of changes and trends in food production, lifestyle factors, and wider social determinants. 2) A list of proposed remedial actions and support to guiding policy at EU- and Member State levels, relevant stakeholders and practitioners as well as citizens in dealing with depression and taking preventative measures.

Area 2.2.2 Nutrition

Understanding beneficial and harmful dietary factors as well as the specific needs and habits of population groups as a major controllable factor in the development and reduction of occurrence of diet-related diseases and disorders including obesity and allergies. This will involve the investigation of new dietary strategies, the development and application of nutrigenomics and systems biology, and the study of the interactions between nutrition, physiological and psychological functions. It could lead to reformulation of processed foods, and development of novel foods and ingredients, dietetic foods and foods with nutritional and health claims. The investigation of traditional, local, and seasonal foods and diets will also be

important to highlight the impact of certain foods and diets on health, and to develop integrated food guidance.

KBBE.2013.2.2-01: New technologies to study brain function in relation to eating behaviour

Call: FP7-KBBE-2013-7 – single stage

Information and guidelines directed towards consumers have not achieved the targeted goal of making consumer choices healthier and more sustainable. It is still unclear what makes consumers decide to choose one food over another. Scientific evidence is lacking on the relationship between the life-long learning process, physiological changes and eating habits on the one hand and food selection and valuation on the other. The way the brain translates perceptions, emotions and knowledge into food choices and the role played by memory, vision, sensory and reward systems and also by the sense of mental well-being are far from clear. An understanding of the underlying brain mechanisms that control food selection and valuation is needed in order to be able to counteract them and give the correct advice to consumers, thereby also preventing the onset of diet-related diseases. This area has been difficult to address due to the fragmentation of specialist expertise, the cost of powerful techniques and lack of harmonisation in the interpretation of the results. Critical mass needs to be reached in order to provide scientists and public health professionals with insights into how to prevent clinical obesity and overweight, eating and malnutrition disorders in an effective and acceptable fashion.

The aim of this topic is to develop, adapt, optimise and validate new or existing tools and technologies, such as brain imaging, for their specific application in consumer and nutrition research, which would help to connect the data on eating behaviour with the ‘softer’ knowledge on reasons for individual consumer choices. Where appropriate, gender issues should be considered. These technologies should contribute to studying obesity and weight management, eating and malnutrition disorders from a completely different perspective. It should offer unique potential for identifying objective measures of stimuli for food intake, satiety and even restraint in eating. Sharing knowledge, best practice, capacity and databases should help identify synergies and create the breakthroughs and innovations needed to develop more effective measures on nutrition and lifestyle. Participation of relevant partners from Australia, Canada, New Zealand and/or the USA will add to the scientific and/or technological excellence of the project and ensure uptake of on-going international efforts in this area.

Funding scheme: Collaborative Project (large-scale integrating project).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.

Expected impact: Development and validation of new research methods, model systems and techniques, such as advanced imaging techniques, will contribute to providing the objective measures and science-based evidence needed to develop a strategy for prevention of diet-related diseases with the ultimate goal of promoting a healthy and active population and a high quality of life. The results are expected to contribute to better dietary guidelines and advice to consumers, not least by improving communication and education on eating habits both within and outside Europe, thereby leading to social innovation. The project will support the European public health policy, such as the White Paper on Nutrition, Overweight and Obesity-related Health Issues⁴⁹.

⁴⁹ http://europa.eu/legislation_summaries/public_health/health_determinants_lifestyle/c11542c_en.htm

KBBE.2013.2.2-02: Factors influencing the human gut microbiome and its effect on the development of diet-related diseases and brain development

Call: FP7-KBBE-2013-7 – single stage

The species and composition of the human gut microbiome have recently been discovered to be potential key factors in the development of innate and adaptive immune function, in development of metabolic syndrome and obesity and in brain development and behaviour. There is therefore a need to define a ‘healthy’ gut microbiome and to understand better its ability to absorb and metabolise food components and to influence energy expenditure and its role in diet-related diseases and brain development. The effects of diet (including food production methods), age, physical activity and other lifestyle factors on the human gut microbiome and its effects on the development of metabolic syndrome and obesity and/or on brain development and behaviour should be studied. The specific species of the human gut microbiome predicting metabolic syndrome, obesity and other co-morbidities and influencing the regulation of developmental programming of the brain should be identified. A multidisciplinary approach combining genetic, epigenetic, metagenomic, metabolomic, microbiological, physiological, nutritional, immunological, brain research, experimental and computational modelling expertise is necessary to gain insights into factors influencing the effects of human gut microbiota on metabolism. Appropriate epidemiological studies and preclinical trials are needed in order clearly to demonstrate the role of the human gut microbiome and the effects of the different factors. Use of existing data/studies on the human gut microbiome is encouraged. Where appropriate, gender issues should be considered. The project further contributes to the International Human Microbiome Consortium⁵⁰ and is encouraged to comply with its principles. Participation of relevant partners from Australia, Canada, New Zealand and/or the USA will add to the scientific and/or technological excellence of the project and ensure uptake of on-going international efforts in this area.

A complementary topic is presented in the work programme of Theme 1 Health on a "high impact research initiative on metagenomics for personalised medicine approaches". During the negotiations, if collaboration between the selected projects can be demonstrated to offer added value, the interconnections and interfaces between these projects but also with other projects in the field will be discussed in order to optimise the cooperation between the projects selected and to ensure maximum synergies.

Funding scheme: Collaborative Project (large-scale integrating project).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.

Expected impact: The project is expected to increase the knowledge of the human gut microbiome. This will contribute to development of new approaches for prevention of metabolic syndrome, obesity and metabolic impairment of the brain and other organs by reshaping the gut microbiome through lifestyle changes, replacement therapies, development of pro- and prebiotics and innovative personalised products. This topic will have an impact on prevention of diet-related diseases with the ultimate goal of promoting a healthy and active population and a high quality of life, both keys to delivering on the EU2020 priority of a socially inclusive and healthy Europe. The European added value lies in the fact that the expected results would be of benefit to European citizens, as they will help to inform new strategies on public health and contribute to the development of new scientific data to support the legislation on health and nutrition claims. This will increase the competitiveness of the European food industry.

⁵⁰ <http://www.human-microbiome.org/>

KBBE.2013.2.2-03: Food-based solutions for eradication of vitamin D deficiency and health promotion throughout the life cycle

Call: FP7-KBBE-2013-7 – single stage

Vitamin D deficiency affects a large proportion of the world's population. Scientific evidence indicates that vitamin D plays a key role in bone health. The current evidence, however, does not support other benefits of vitamin D intake. Higher levels of intake have not been shown to confer greater benefits, but in fact have been linked to other health problems. The aim of this topic is to explore food-based strategies to bridge the gap between current intakes of vitamin D in European populations and dietary targets. Data are provided to determine vitamin D requirements in specific population life-stage subgroups, particularly pregnancy, lactation, infancy, childhood and adolescence. In addition, human intervention studies are carried out to explore further the existing epidemiological observations linking vitamin D and non-skeletal health outcomes. Technological solutions in the food sector will be explored to underpin appropriate and sustainable food-based strategies to prevent vitamin D deficiency. The advantages and limitations of such technological solutions will be compared to those offered by promoting better lifestyles and healthier diets. The ongoing work carried out by the European Food Safety Authority (EFSA) regarding the safety of vitamin D and the possible revision of tolerable upper intake levels are taken into account. Where appropriate, gender issues should be considered.

Funding Scheme: Collaborative Project (large-scale integrating project).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.

Expected Impact: Together with dietary recommendations, the project will inform on appropriate and sustainable food-based strategies that could contribute to reducing vitamin D deficiency, to preventing diet-related diseases, and to improving health and quality of life of citizens. It will also inform on new strategies on public health. Besides, this project will increase competitiveness of the European food industry through the development of new food products. It will also complement the activities of EFSA and national food policy and regulatory bodies and support European public health policy in general.

Area 2.2.3 Food processing

Optimising innovation in the European food industry through the integration of advanced technologies into traditional food production including fermented food, tailored process technologies to enhance the functionality, quality and nutritional value of food including organoleptic aspects in food production including new foodstuffs. Development and demonstration of high-tech, eco-efficient processing and packaging systems, smart control applications and more efficient valorisation and management of by-products, wastes, water and energy. New research will also develop sustainable and novel technologies for animal feed, including safe feed processing formulations and for feed quality control.

KBBE.2013.2.3-01: Development and industrial application of sensors for food processing operations

Call: FP7-KBBE-2013-7 – single stage

The aim of this topic is to develop versatile and affordable sensors to be applied for the quantitative, real-time, on-line or in-line control of critical quality and performance attributes for raw and in-process materials during food processing in the context of Process Analytical Technology (PAT). The sensors can also be part of a software sensor for statistical data

analysis and interpretation, and can be used as a tool predicting the features of the final product. The rapid, sensitive and easily cleanable sensors developed ensure both food quality and safety and therefore reduce the amount of non-conforming products to be wasted, thereby leading to higher bio-resource efficiency and production sustainability. The sensors are integrable in systematic preventive approaches such as the Hazard Analysis and Critical Control Point (HACCP) method, and serve as building-blocks for practical decision-making tools and early warning systems. They are auto-adaptive, quickly operative for any product or condition and robust to the variability of raw materials and line operators. Dissemination to equipment producers and the food industry and demonstration activities in the food industry are required to fill the gap between development of the concepts and practical implementation.

Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs).

Up to three projects may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 3 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 20 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: This topic boosts the competitiveness of the European processing industries and increases the number of patents in this area. It also contributes to reducing food waste and to production sustainability, through more efficient control of processes. The results of research on this topic are of interest and potential benefit to SMEs in the IT, equipment and food industries. Strong participation by SMEs in the project itself will contribute to reaping that benefit. The European added value lies in the need to build up critical mass for multilateral efforts by all the players mentioned above.

KBBE.2013.2.3-02: Network for the transfer of knowledge on traditional foods to SMEs

Call: FP7-KBBE-2013-7 – single stage

The objectives are: (1) transfer knowledge and apply research results in traditional foods in SMEs; (2) develop a strategic research and innovation agenda for traditional foods; and (3) foster entrepreneurship. SMEs producing traditional food products, in particular craft producers, usually have little capability of their own for research and innovation and seldom possess the financial and human resources needed to participate in collaborative projects with universities or research centres. Ethnic foods may be considered in this topic as well.

The first aim of this topic is to establish or support a network that transfers innovative knowledge to SMEs or among existing SME programmes, clusters or associations. The network initiates and facilitates collaboration to develop or improve sustainable and innovative processes and technologies with the objective of improving the quality, safety and environmental performance of traditional food products made by SMEs. At the same time, production protocols for traditional products are stabilised. The network helps SMEs to deal with legal issues in food innovation such as intellectual property rights and the European food law – also making the best possible use of labels for geographical indications and traditional specialities –, and supports their product development strategies and competitiveness.

A second task for the network is, where necessary, to come up with a strategic research agenda for traditional foods that is based on specific food groups and responds to the needs of all stakeholders.

As a third task, the topic stimulates innovation and entrepreneurship among food researchers, commercial take-up of food R&D results, and entrepreneurial networking. Training modules

and programmes for food researchers are developed, translated into a variety of languages and implemented.

In close collaboration with the European Innovation Partnership (EIP) on 'Agricultural Productivity and Sustainability', the network makes use of existing or emerging innovative activities and entrepreneurship training programmes at local, regional or national level, e.g. those funded by the rural development programmes of the Common Agricultural Policy or by local, regional or national initiatives. The funds for the network are used mainly to fund action at cross-regional, cross-border or EU level. The network makes the tools developed available to other stakeholders.

The network is made up of several sub-networks, each having a limited focus – for example a region, a language, a food or a food group, a specifically defined production system or innovative and fair distribution concepts – in order to address directly the SMEs targeted. The network can also connect ongoing national or regional initiatives such as the national platforms of the European Technology Platform (ETP) 'Food for Life' or projects supported by other EU schemes. A leading role in the governance of the proposed project should be given to SMEs, clusters or associations.

Funding scheme: Coordination and Support Action (supporting action).

Up to two projects may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 4 000 000 per proposal.

Expected impact: The results of the project are expected to be of interest and potential benefit to the SMEs and other market players that are members of the network or collaborate with it. The actions facilitate effective transfer of innovations to and between stakeholders in the traditional agri-food business in order to maintain and increase the competitiveness of the agri-food sector, in particular of SMEs, on an increasingly global European market. Other kinds of impact are consumer satisfaction and a contribution to a transparent and sustainable supply chain with higher bio-resource efficiency. Europe-wide, the entrepreneurship training part has a marked impact on entrepreneurship, by addressing innovation skills gaps, and on capacity-building, by generating motivated and knowledgeable entrepreneurs in the food sector. The high European added value of this action lies in the support it will give to the EU Innovation Union in the form of upgrading and sharing knowledge, contributing to a socially inclusive and healthy Europe, and developing sustainable collective governance approaches at local, regional, and national levels. Achievement of the three tasks on a regional basis also supports Member States and regions in developing their smart specialisation strategies by focusing, where appropriate, on the traditional food sector, with a view to strengthening regional competitiveness and the regional economy. The challenge is pan-European and clearly goes beyond national interests. Projects supported under this topic lead to greater integration of research players and activities from across the European Union, and from the candidate countries.

Area 2.2.4 Food quality and safety

Assuring chemical and micro-biological safety and improving quality in the European food supply. This will include understanding the links between microbial ecology and food safety; developing methods and models addressing the integrity of the food supply chains; new detection methods, traceability and its further development, technologies and tools for risk assessment, including emerging risks, management, and communication, as well as enhancing the understanding of risk perception. This will also include science based methods for risk benchmarking in the field of food safety.

KBBE.2013.2.4-01: Assuring quality and authenticity in the food chain

[Cross-cutting with Activities 2.1 Sustainable Production and 2.3 Biotechnology]

Call: FP7-KBBE-2013-7 – single stage

Globalisation and the growing complexity of the food chain, combined with recent food scares, have raised consumer awareness regarding the quality and authenticity of the food they consume. ‘Food authenticity’ means the assurance that food purchased by consumers matches its description, e.g. the declaration of specific quality attributes in high-value products, origin (e.g. geographical such as products with protected designation of origin (PDO) or protected geographical indication (PGI), botanical, species), production method (e.g. organic farming, traditional production methods, sustainable production with high bio-resource efficiency), processing technologies (e.g. irradiation heating, freezing), environmental footprint, social impact, quality control procedures (e.g. pesticide residues analysis), certification and compliance with set food standards. European consumers are prepared to pay extra for added-value foods and are increasingly demanding understandable and reliable information on food labels. These trends have added to the need to harmonise food standards and develop accurate tools to verify that foods match their description and to detect fraud. Priority should be given to products which are the most exposed to fraud (e.g. olive oil). In addition, there is a need to coordinate and harness transnational capacity and resources, especially databases, reference materials, training and research capabilities and priorities. The main objective of this topic is to determine the current state of the art, to centralise, share and harmonise existing data and know-how, to identify gaps, to prioritise research needs and, subsequently, to coordinate research activities in the area of food quality and authenticity assurance by launching competitive calls in accordance with the provisions of Article 26(3) of the FP7 Rules for Participation^{51;52}. These research activities may include providing reference materials and databases, conducting feasibility studies, identifying markers to confirm the quality and/or authenticity of foods (or potential adulterants), developing, validating and standardising verification methods, understanding consumer concerns, attitudes and perceptions relating to food authenticity and promoting dissemination of results and technology transfer.

Funding scheme: Collaborative Project (large-scale integrating project).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.

Expected impact: The European added value lies in offering authentic, high-quality food from sustainable production to consumers and in strengthening the competitiveness of European food producers by enabling them to add value to their products. The results of the project are expected to help food producers to communicate better the qualities, characteristics and attributes of the different food commodities. In addition, determining the authenticity of foods can reduce trading blocks and prevent fraud in the form of false descriptions, substitution of cheaper ingredients and adulteration, along with incorrect origin labelling. This will allow consumers to make informed choices and restore consumer confidence. The research activities launched within this project should clearly support EU policies on food quality, marketing standards and food information to consumers.

Area 2.2.5 Environmental impacts and total food chain

⁵¹ http://cordis.europa.eu/fp7/competitive-calls_en.html

⁵² <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:391:0001:0018:EN:PDF>

Protecting both human health and the environment through a better understanding of the environmental impact on and from food/feed chains. This will involve study of food contaminants and health outcomes, monitoring of environmental effects, developing enhanced tools and methods for the assessment and management of impacts on, and resistance of, food and feed chains to global changes, in particular to the environment. Assuring quality and the integrity of the food chain requires new models for commodity chain analysis and total food chain management concepts, including consumer aspects.

KBBE.2013.2.5-01: Assessment of the impact of global drivers of change on Europe's food security

[Cross-cutting with Activity 2.1 'Sustainable Production']

Call: FP7-KBBE-2013-7 – single stage

The aim of this topic is to obtain a comprehensive picture of the effects of the global drivers of change (climate, economic concentration and market structure, financial power, resource competition, marginalisation, property rules, geo-political shifts, consumer preferences, consumption patterns and nutritional transition, etc.) on European and global food demand and raw material production and, consequently, food flows. The research focuses on the vulnerability and resilience of European food systems in a context of socio-economic, behavioural, technological, institutional and agro-ecological change and look into the new challenges and opportunities that the food sector will face in future. Vulnerability assessment methodologies and dynamic modelling tools are reviewed, upgraded or developed for assessing the resilience of Europe's agri-food sector and food security situation as well as for determining the sustainability frontiers of different food production systems under newly prevailing conditions are reviewed. Following the analysis, scenarios are designed for the desired developments in the food supply chain and guidance given as to support the transition process. Research activities address the major societal risks associated with globalisation as a means of predicting change, provide insight into conflict prevention and resolution and guide policy-making. Recommendations to underpin Europe's medium- and long-term food security situation are formulated for EU policy-makers with a view to promoting social innovation and stability in Europe and its partner regions.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 4 000 000 per proposal.

Expected impact: The European added value of this topic lies in its potential for an integrated approach encompassing, in a single conceptual framework, the total food system from consumers to ecosystems while addressing all involved in the system, either in their individual dimension and/or in their interactions. This innovative approach has the capacity to identify policy responses to address the currently dysfunctional food system – characterised by relatively high numbers of malnourished, micronutrient-deficient and overweight people – thanks to a better understanding of the interdependence of production, trade and stocks, of the unpreparedness to meet the vagaries of the weather and dependency on external inputs and of the incentives needed to create a food system that is more resilient, equitable, healthy and sustainable. Research draws attention to the direction in which social and technological innovation has to be channelled in order to arrive at the desired innovation in food consumption patterns and behaviour, in business models and legal frameworks and in the role and management of real grain stock reserves and ways to mobilise these in times of need or any other management tool for crisis prevention.

KBBE.2013.2.5-02: Saving water and energy for resource-efficient food processing

Call: FP7-KBBE-2013-7 – single stage

The aim of this topic is to provide engineering offering a means for significant and simultaneous saving of water and energy⁵³ along the entire length of the post-harvest chain at all scales of business: from supplying raw ingredients to processing (operations and cleaning), packaging, warehousing, distributing, retailing and household handling of food commodities. A sufficiently representative sector of the food industry has to be targeted; the selection has to be well justified in terms of technological and policy relevance. Optimised, emerging and novel food production and storage technologies, equipment and/or logistics are developed for sustainable, environmentally-benign, water- and energy-efficient and consumer-friendly food manufacturing and handling, whilst improving or at least maintaining food quality and safety. For that purpose, a diagnosis has to be performed of the water and energy consumption of the food processing and the whole food chain in the sector targeted. This also involves considering the rebound effect, process modelling and simulation, and an environmental, social and economic life-cycle assessment of processes in line with the International Reference Life Cycle Data System (ILCD) handbook⁵⁴. Dissemination of research results to equipment producers and the food industry and demonstration activities in the food industry are required to fill the gap between development of the concepts and practical implementation.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

Up to three projects may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 20 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: The European added value lies in an innovation-driven increase in the competitiveness of food producers and food equipment manufacturers, in particular SMEs, while reconciling sustainability imperatives. Involving SMEs in the project itself contributes to achieving these societal objectives. The research leads to notable reductions in water and energy consumption, while at the same time ensuring sustainable economic growth. The research contributes to reaching the objective of a resilient, sustainable and productive food chain, in line with the European Commission Strategy "Innovating for Sustainable Growth: A Bioeconomy for Europe". Besides that, it also contributes to achieving the specific resource-efficiency objectives for 2020 and beyond, as planned in the "Roadmap to a resource-efficient Europe", which is a key part of "A resource-efficient Europe", one of the flagship initiatives of the Europe 2020 Strategy. Both aim to help transform Europe into a knowledge-based, resource-efficient economy.

Area 2.2.6 European Research Area

KBBE.2013.2.6-01: Exploitation of results of Framework Programme projects in food, health and well-being by small and medium-sized enterprises

⁵³ For the purposes of this topic, the term 'energy saving' is used as in the Communication *Energy Efficiency Plan 2011*, which says that "Technically, 'energy efficiency' means using less energy inputs while maintaining an equivalent level of economic activity or service; 'energy saving' is a broader concept that also includes consumption reduction through behaviour change or decreased economic activity. In practice the two are difficult to disentangle and – as in this Communication – the terms are often used interchangeably."

⁵⁴ <http://lct.jrc.ec.europa.eu/pdf-directory/>

Call: FP7-KBBE-2013-7 – single stage

The aim of this topic is to allow SMEs to take up research results from earlier FP funding in food, health and well-being. This follow-up project turns the scientific and technological knowledge available into sustainable and innovative processes, products or services, thereby clearly going beyond the earlier project(s). It involves a demonstration phase or proof of concept, a business plan and an environmental, social and economic life-cycle assessment in line with the International Reference Life Cycle Data System (ILCD) handbook⁵⁵ (if applicable). The proposal has to show that the knowledge was generated earlier and that the results have already been achieved and are available for further research and development – mere ‘expected results’ are not acceptable as a basis for project selection. Supporting documents describing the related former research results may be provided in an annex to Part B of the proposal, which will be taken into consideration during evaluations. Although the principal research has been carried out in earlier project(s), further research and development remains central to the project and allows SMEs to get nearer to actual application.

The Commission will positively evaluate projects having a maximum duration of two years.

Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs)

Up to five projects may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 2 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 75 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: This approach pays more attention to the innovation phase. Beyond adding to the impact of an earlier project, it also improves the S&T capabilities, the innovation potential and the competitiveness of the SMEs taking part. The European added value lies mainly in the leverage effect on private investment, the cooperation of private companies with foreign partners on a scale not possible at national level and the reduction of the commercial risk by actually applying existing and ready-to-use research results actually applicable across Europe and beyond, through effective dissemination and take-up activities.

⁵⁵ <http://lct.jrc.ec.europa.eu/pdf-directory/>

Activity 2.3 Life sciences, biotechnology and biochemistry for sustainable non-food products and processes

- *Strengthening the knowledge base and developing advanced technologies for terrestrial or marine bio-mass production for applications in industrial processes and in energy production. This will include plant, animal and microbial genomics and metabolomics to improve the productivity and composition of raw materials and bio-mass feedstocks for optimised conversion to high added-value products including biological resources utilisable in pharmaceutical industry and medicine, while exploiting natural or enhanced terrestrial and aquatic organisms as novel sources. This will fully incorporate life cycle analysis of bio-mass production practices, transportation, and storage and market deployment of bio-products.*
- *Addressing the application of industrial bio-technologies within whole crop and forest bio-mass chains to realise the full potential of the bio-refinery approach (e.g. green chemicals), including socioeconomic, agronomic, and ecological and consumer aspects. This will be enhanced by an increased understanding and control of plant and microbial metabolism at the cellular and sub-cellular level, and how this is integrated into whole system performance in the production of high value commodities deploying bio-processes with increased yield, quality and purity of conversion products, including bio-catalytic process design.*
- *Using or developing bio-technologies for novel and improved high quality, high added-value and renewable forest based products and processes to increase sustainability of wood and wood production, including timber, renewable materials and bio-energy stocks.*
- *Addressing the potential of biotechnology to detect, monitor, prevent, treat and remove pollution.*
- *Maximising the economic value of waste and by-products through new and potentially energy-saving bio-processes, alone or in combination with plant systems and/or chemical catalysts.*

Area 2.3.1 Novel sources of biomass and bioproducts

The production of bio-mass in terrestrial environments is of greatest importance for the development of the KBBE as this will deliver feedstocks and precursors for nearly all bio-industries or directly saleable end-products.

Research and development activities will foster the optimisation of these biomasses for industrial purposes. It will generate knowledge in metabolic control, pathway design, metabolic engineering in plants, animals and other organisms (such as fungi)⁵⁶, and domestication and breeding, also improving agricultural traits. Novelty will rely to some extent on screening of terrestrial biodiversity and discovery of new organisms and new biochemical pathways. The development and optimisation of novel expression systems in terrestrial organisms will eventually lead to new products and practices.

KBBE.2013.3.1-01: Plant High Value Products - from discovery to final product⁵⁷

Call: FP7-KBBE-2013-7 – single stage

The terrestrial plant biodiversity remains an untapped source of natural bioactive molecules of importance for various industrial applications, such as high value agro-chemicals, pharmaceuticals, biomaterials, cosmetics, flavours, food additives, food supplements etc. Their efficient utilization requires an integrated and comprehensive effort from the stage of

⁵⁶ However, the focus will be on plant and animal biotechnology. Microbial biotechnology will be mainly covered in Areas 2.3.3 and 2.3.5.

⁵⁷ This topic cuts across Area 2.3.1 Novel sources of biomass and bioproducts and Area 2.3.4 Biorefinery.

biodiscovery, including plant bioprospecting, through identification of suitable bioactive compounds, then to optimised domestication and cultivation strategies for selected plant species or ecotypes, metabolic engineering of the selected biochemical pathways to improving the productivity and finally to product development and commercialisation.

The projects will engage in a full chain of research and innovation needed to bring to market new or improved products aiming at innovative methodologies in order to tackle the existing bottlenecks and addressing the needs of the bio-industry. The focus is on the efficient exploitation of the novel bioactivities, especially in case of unusual and/or underutilised plant species/ecotypes. This includes sustainable access to raw material, particularly in case of plants that are endangered, protected or difficult to collect and cultivate, and improvements in technical aspects of the metabolic engineering pipeline (e.g. metabolomics, new gene mining concepts, isolation of biomolecules, their purification and sustainable production either *in planta*, or in alternative biological systems). The projects can explore interactions of plants and other natural organisms (e.g. fungi, microorganisms) to achieve the objectives.

The targeted plants can originate from a broad range of European and/or non-European species (e.g. medicinal or aromatic), either cultivated (e.g. industrial crops) or collected from the wild. The full use of the residual plant biomass should be explored in a cascade biorefinery approach. The projects are to be industry-driven and will include demonstration activities to prove the techno-economic feasibility and effectiveness of production and extraction systems. Downstream processing and separation aspects will form an integral part of the projects. Economic and regulatory issues should also be taken into account both in respect of conditions found in Europe and outside of Europe. SMEs may use advisory and support services to treat such issues and other aspects regarding market introduction. The project must adhere to relevant international rules on access to, the sustainable use of and the fair and equitable sharing of benefits arising from the utilisation of biological resources in line with the applicable domestic frameworks of source countries and the Convention on Biological Diversity and its Nagoya Protocol. Dissemination and training activities (e.g. summer schools, press releases, open days) will form an essential part of the projects.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

The topic aims at financing a limited number of large collaborative projects within an overall maximum budget of EUR 20 000 000.

Additional eligibility criterion:

- The estimated EU contribution going to SMEs shall be at least 25% of the total requested EU contribution. This will be assessed at the end of the negotiation, before the signature of the Grant Agreement.

Expected impact: The projects will advance the sustainable use of terrestrial plant biodiversity for diverse germplasm to enable a better assessment of species potential, and development of sustainable methods for obtaining the required feedstock, and then converting them to high value products. The European Added Value will lay in the development of novel plant-based 'eco-friendly' products with bioactive properties, especially in pharmaceutical, cosmetic or agrochemical sectors, leading to significant environmental and economic benefits for the society at large. The products developed will be advantageous to the consumers by being cheaper, more readily accessible and more environmentally friendly compared to the existing alternatives. The projects will strengthen the competitiveness⁵⁸ of European plant biotechnology industry, as well as increase competition in research and innovation. This topic

⁵⁸ Building upon, making active use and answering to the different elements of competitiveness proofing as outlined and explained in the Commission Staff Working Document entitled "Operational Guidance for Assessing Impact on Sectoral Competitiveness within the Commission Impact Assessment System – A "Competitiveness Proofing" Toolkit for use in Impact Assessment – see http://www.cc.cec/sg_vista/cgi-bin/repository/getdoc/COMM_PDF_SEC_2012_0091_F_EN_DOCUMENT_TRAVAIL_SERVICE.pdf

is particularly well suited for an active engagement of International Cooperation Partner Countries. Their involvement should strengthen the expected impact of the research to be undertaken. This will be assessed at the evaluation. The projects funded should be complementary and reinforce related on-going FP7 KBBE projects on the plant biotechnology. It is expected that the projects will anticipate future trends and consumer demands with a strong focus towards the market and product commercialisation.

KBBE.2013.3.1-02: EU-Latin America Partnering Initiative on sustainable biodiversity in agriculture

Call: FP7-KBBE-2013-7 – single stage

The biodiversity preservation in agricultural systems is vital not only for the environmental protection but also for the sustainable development of the European and global bioeconomy. The project developed under this topic will contribute to identifying promising underutilized / novel crops, their conservation/domestication, and to exploring opportunities for the sustainable commercial use of the natural biological resources in agriculture, especially for the benefit of the local communities and family farmers. The project will have a dual aim: first identifying and linking existing agricultural resource collections (e.g. plant germplasm banks, botanical gardens, agro-microbial strain collections), as a network to facilitate transfer of knowledge and technology between the stakeholders, in order to lessen environmental pressure on endangered or protected plant species, and second, identifying among them suitable resources, which could be subsequently used for sustainable commercial use. The second aim should target in particular novel or underutilised agricultural plants. The participation of the International Cooperation Partner Countries, especially from Latin America is seen as critical in the project and is especially encouraged. The project will develop efficient communication and dissemination tools (e.g. a website, conferences, activities aimed at general public, summer schools etc), engaging in dialogue with relevant stakeholders (international policy makers, NGOs, etc), to contribute to the dual aims, and will ensure a long lasting impact of the project. The project must adhere to relevant international rules on access to, the sustainable use of and the fair and equitable sharing of benefits arising from the utilisation of biological resources in line with the applicable domestic frameworks of source countries and the Convention on Biological Diversity and its Nagoya Protocol. The project should take stock of the related past and on-going projects and to complement them in an integrative approach.

Participants from Latin American countries in a Science and Technology agreement with the European Union⁵⁹ will support their participants to the project. Participants from other Latin American ICPC countries could be funded by the EU. The cooperation with complementary actions should be reflected in the proposal. This will be considered in the evaluation.

Funding scheme: Coordination and Support Action (coordinating action).

One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 1 000 000 per proposal.
- Minimum number of participants: 3 independent legal entities from different Member States or Associated countries and 3 from different ICPC countries from Latin America.

⁵⁹ The European Union has Science and Technology Cooperation Agreements with the following Latin American countries: Argentina, Brazil, Chile and Mexico. MinCyT (Ministry for Science and Technology) for Argentina, FIA (Foundation for Agrarian Innovation) for Chile and Conacyt (National Council for Science and Technology) for Mexico are main interlocutors of the EU in the context of this call for proposal and intend to support and/or carry out mirroring and complementary actions.

Expected Impact: The topic addresses two issues with high societal relevance and of public concern: improved global efforts for biodiversity protection in agriculture, and the sustainable use of the natural biological resources, especially for the benefit of the local communities and family farmers. The project will raise public awareness on plant biodiversity preservation in agriculture and will support a structured global environment for cooperation between relevant stakeholders in this area. The effectiveness and long-term impact of the project will be ensured by including complementary European and global participation.

Area 2.3.2 Marine and fresh-water biotechnology (blue biotechnology)

The economic and scientific potentials of aquatic environments (principally marine but including freshwater also) remain insufficiently explored using the power that modern biotechnology provides. Moreover, their resources remain largely untapped by European industry. Extreme or specific environmental conditions (e.g. in temperature, pressure, salt content, pH, chemical composition) and the enormous biodiversity of these ecosystems offer multiple opportunities for bio-prospecting, exploitation and use of microbes (e.g. cyanobacteria, fungi), plants (micro- and macro-algae) and animals (e.g. fish, molluscs, sponges) and their physiological performance and genes. This can lead to novel products or sources for industrial applications (e.g. bio-processing, biomass, bio-energy, bio-materials, specialties, pharmaceuticals, and aquaculture) and beyond.

KBBE.2013.3.2-01: Marine biotechnology ERA-NET

Call: FP7-ERANET-2013-RTD

Cooperation between European research funding bodies in the area of Marine Biotechnology started in FP7 under the umbrella of the KBBE-NET high-level group and continues within the ERA-NET Preparatory Action which is providing a successful forum for the exchange of information, and has initiated the process of identifying complementarities between the research funding bodies, thus creating a basis for developing future joint, transnational calls. The proposed network of European research funding bodies in the area of Marine biotechnology will thus build upon these previous initiatives and will capitalise on its achievement, such as, the analysis of the current landscape in Europe and beyond, the mobilisation of key stakeholders as well as the set up of initial cooperation tools to develop joint programmes and pool resources for collaborative research at European scale.

The overall aim of this ERA-NET is to further increase the level of coordination between European research funding bodies in the area of Marine Biotechnology, seeking complementarities between national activities and pooling resources to undertake joint funding of transnational projects.

Research collaborations should serve to tackle scientific and industrial challenges to establish Europe as a world leader in strategically-important areas of marine biotechnology and to better integrate and rationalise existing infrastructures and databases. These collaborations will address the important role of marine biotechnology for the development of related industries.

The network should seek to expand the previous ERA-NET preparatory action membership to include new funding bodies from other Member States and Associated Countries. In setting priorities for the network's activities it is important that complementarity with other FP7 initiatives is sought and that interactions are established with related ERA-NETs and ETPs across the marine and relevant sectors. It is expected that the opportunity for future global initiatives in the area of marine biotechnology will also be analysed.

Funding scheme: Coordination and Support Action (coordinating action).

Eligibility and evaluation criteria: please refer to Annex 4 of the Cooperation Work Programme including the Call Fiche "FP7-ERANET-2013-RTD".

Expected impact: The project supported under this topic should lead to a greater integration of research actors and activities from across the enlarged European Union, and the candidate countries. It is expected that the proposal will consolidate the basis for further coordination efforts in the area of Marine Biotechnology; seek for complementarities between national activities, and start pooling resources for funding and implementing future research activities in a synergistic manner. Ultimately, the cooperation should lead to a self-sustainable and long lasting network of programme managers in the area of marine biotechnology, enabling the translation of information gained from innovative fundamental research into social, environmental, geographical and economic benefits. The European added value lies in supporting and enhancing the ERA in the field of marine biotechnology.

OCEAN.2013-1: Biosensors for real time monitoring of biohazard and man made chemical contaminants in the marine environment

Call: FP7-OCEAN-2013

For the full topic text and further information, please refer to the description of the OCEAN.2013-1 topic under Area 2.1.5 and the FP7-OCEAN-2013 Call fiche.

OCEAN.2013-3: Innovative antifouling materials for maritime applications

Call: FP7-OCEAN-2013

For the full topic text and further information, please refer to the description of the OCEAN.2013-3 topic under Area 2.1.5 and the FP7-OCEAN-2013 Call fiche.

KBBE.2013.3.2-02: The CO₂ algae biorefinery⁶⁰

Call: FP7-KBBE-2013-7 – single stage

Algae represent a promising alternative to convert CO₂ (e.g. from the atmosphere of capture in industrial processes) into high added-value products and biofuels. Algae biorefineries can thus alleviate food *versus* fuel conflicts and may become particularly advantageous for regions with limited biomass availability and land unusable for agriculture.

The topic aims at developing innovative approaches to tackle the major challenges intrinsic to the development of the algae biorefineries. The proposals under this topic should focus on the production of high value-added products such as polymers, pharmaceuticals, high value oils and chemicals, bioactive compounds, colorants, etc. The potential integration with other processes (such as the production of biofuels, water treatment or carbon sequestration) and the valorisation of all products should be considered to assure the economic, environmental and social viability of the whole concept.

Strong weight will be put on industrial leadership of the projects. They should include the development of suitable algal strains and cultivation parameters. Boundaries to this aim include algal biodiversity exploration (bioprospecting, natural growing conditions), improvement of photosynthetic efficiency, customising and maximising added value products' yields and development of algae cultivation methods adapted to mass production. Design and development of different cultivation systems with innovative and efficient configurations should also be included together with sustainable downstream processes such as harvesting, dewatering, product extraction, purification, formulation as well as its integrated conversion. Projects should include demonstration activities to prove the techno-economic viability of the proposed concept. The overall economic, social and environmental sustainability approach (e.g. water and energy saving) as well as its Life Cycle Assessment should be critical elements of the project.

Funding Scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

⁶⁰ This topic cuts across Area 2.3.2 Marine and fresh-water biotechnology (blue biotechnology) and Area 2.3.4 Biorefinery.

The topic aims at financing a limited number of large collaborative projects within an overall maximum budget of EUR 20 000 000.

Additional eligibility criterion:

- The estimated EU contribution going to SMEs shall be at least 25% of the total requested EU contribution. This will be assessed at the end of the negotiation, before the signature of the Grant Agreement.

Expected Impact: Delivering a robust scientific and technological basis for substantiating strategic decisions for the industrial development of algae for high added-value products. The integrated production of biofuels and other bulk products such as food and feed proteins and fertilisers together with the targeted high value added products can increase the cost competitiveness of the biorefinery concept. The projects will as well strengthen the competitiveness of the European marine biotechnology industry and by reducing technical bottlenecks in this area making the whole sector more attractive to investment by the biotechnology industry.

Area 2.3.3 Industrial biotechnology: novel high added-value bio-products and bio-processes

This Area will address the development and application of industrial biotechnology for the production of high-value products such as fine and speciality chemicals, antibiotics, vitamins, detergents, etc. Industrial biotechnology enables industries to deliver novel products which cannot be produced by conventional industrial methods; in addition it will make possible replacing chemical processes by more resource efficient biotechnological methods with reduced environmental impact, thereby extending and strengthening the KBBE.

Research and development will enable among others the discovery of novel enzymes and micro-organisms with novel applications, the elucidation and optimisation of their functions, improvements in concept and design of bioreactors, such as biocatalytic process design, advancing fermentation science and engineering, and improving up- and down-stream processing where relevant.

KBBE.2013.3.3-01: Support for demonstrating the potential of biotechnological applications⁶¹

Call: FP7-KBBE-2013-7 – single stage

Europe stands strong in producing world-class research but lags behind its main competitors in innovation and commercial exploitation. Enhancing the patent system in Europe, facilitating technology transfer and improving access to finance could facilitate bringing scientific breakthroughs to the market place. This demonstration action will address some of these issues by providing support for bringing research results closer to market, thus enhancing the economic impact of the Biotechnology programme.

The demonstration action will introduce a real innovation focus by promoting the exploitation of results and offering seamless support to the industry and in particular SMEs. The demonstration activities will address technical and economic feasibility issues that will accelerate market introduction of the innovative bio-based goods and services.

The demonstration action is bottom up, with the specific scope of the proposal defined by the participants. Proposals should nevertheless fit within the "Life sciences, bio-technology and bio-chemistry for sustainable non-food products and processes"-Activity described in the Specific Cooperation Programme⁶². The action is primarily aimed at industrial participants

⁶¹ This topic is relevant to the whole Activity 2.3.

⁶² 2006/971/EC: Council Decision of 19 December 2006 concerning the Specific Programme Cooperation implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013).

who should take the lead in the demonstration phase with research, academic or other organisations providing advisory and support services in a possible supporting role. The projects need to have a clear link with the preceding research phase and should help to commercialise research results. Activities can include testing of product-like prototypes, scale-up studies, performance verification and implementation of new technical and non-technical solutions. However, the EU contribution to the project is restricted to demonstration activities, other activities and management. Projects can rely on existing demonstration plants or infrastructure but should not include the construction of new ones. Proposals should also include detailed economic viability check, market studies/business plans or market strategies.

Funding scheme: Collaborative Project (large-scale integrating project)

The topic aims at financing a limited number of large collaborative projects within an overall maximum budget of EUR 20 000 000.

Additional eligibility criterion:

- The requested EU contribution shall be restricted to demonstration activities, other activities and management

Expected impact: Projects under the scheme for demonstration aim at bridging the gap between research and market, while keeping a pre-competitive nature. The concept is to prove the techno-economic viability of a new solution (itself an outcome of a successful research project) that offers a potential economic advantage, but which cannot be directly commercialised. The expected impact should be clearly described both at qualitative and quantitative level, providing an indication of the expected economic impact, e.g. on turnover, employment or target markets as well as expected patent applications or licence agreements, creation of spin-off companies, etc. Through this demonstration action, commercial companies, especially SMEs, will be able to receive seamless support for the further development of successful research results. This should help prepare and facilitate market introduction of scientific breakthroughs. This is particularly relevant in the field of biotechnology where the timelines for technology maturation can be extended. Projects ensure to respect basic ethical principles and include provisions for communication and dissemination of results.

KBBE.2013.3.3-02: Bioeconomy and bioregions⁶³

Call: FP7-KBBE-2013-7 – single stage

The bioeconomy can significantly contribute to the future development of rural, coastal and industrialised regions by improving the sustainable exploitation of their natural and industrial resources, for example by creating supply chains for residues and waste as feedstock for bio-based industries, or the setting up of networks of biorefineries.

The objective of this topic is to develop region-specific bioeconomy strategies based on a socio-economic, environmental and technological assessment of the bioeconomy potential of the different regions in Europe (at sub-and supranational level in Europe). To achieve this, the project will 1) develop criteria to describe the regions in terms of their bioeconomy potential (e.g. based on geographical location, climate, predominance of bioeconomy sectors, bioclusters, job situation, existing skills, resources and technologies, etc); 2) compile a catalogue of instruments and measures (ranging from education, research and innovation to infrastructure, including advisory and support services to SMEs) that can be correlated against the criteria and will foster the development of regional bioeconomies; 3) create a catalogue of good practices and case-studies on bioeconomy that can be used as inspiration for the development of regional smart specialisation strategies; and 4) prepare regional profiles based

⁶³ This topic is relevant to the whole Activity 2.3.

on the developed criteria that will describe the state-of-play of the bioeconomy in the selected regions and propose instruments and measures to improve the exploitation of this potential.

The project will liaise with local, regional and national authorities and relevant stakeholders (e.g. bioclusters) to establish the regional profiles. It will create a network structure that will encourage the exchange of best practices and the creation of synergies between regions. As such, it will also contribute to the development of smart specialisation strategies of regions in accordance with the new European cohesion policy, notably by making data available in a form suitable for insertion in existing catalogues such as the European Cluster Observatory, the Regional Innovation Monitor or the Smart Specialisation Platform.

The activities of the project will take into account existing FP7 and CIP projects and other initiatives supporting the bioeconomy at regional and national level.

Funding Scheme: Coordination and Support Action (supporting action).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 1 000 000 per proposal.

Expected impact: The project will allow regions to recognise their bioeconomy potential and assist them in formulating clear targets to promote their local bioeconomy and in creating a favourable environment to attract public and private investment. The project will contribute to implementing the objectives of several European policy initiatives, such as the Bioeconomy Strategy, rural and coastal development and regional policies.

KBBE.2013.3.3-03: Opening markets for bio-based products: Standardisation, labelling and procurement⁶⁴

Call: FP7-KBBE-2013-7 – single stage

Bio-based products create entirely new markets or enter markets dominated by well-established petro-chemical products. Regulatory instruments like standards and labels can significantly contribute to the uptake of bio-based products in consumer markets and in public procurement. The objective of this topic is to:

- Develop standard test methods and test data for generally applicable European standards on functionalities of and standard sustainability criteria for bio-based products that are compatible with previous work on standardisation, e.g. on the determination of bio-based content (carbon and biomass), product functionalities and biodegradability. As a minimum, these standards need to be developed for biopolymers, -lubricants, -surfactants and -solvents.
- Assess the suitability of the Ecolabel criteria for bio-based products, in view of possibly creating a dedicated product group and further developing and improving the Ecolabel criteria for bio-based products in accordance with the developed standards on functionality and sustainability criteria.
- Create an initial European product information list for bio-based products that will contribute to enabling public procurement for bio-based products and promote their uptake in consumer markets

The proposal should ensure a link with the activities of the European Committee for Standardisation (CEN) concerning bio-based products and take into consideration related standardisation mandates (already issued and in process) and existing national and EU-funded projects. The proposal should explore possibilities for harmonising standards and normative measures in the EU, US, Japan, China, Brazil, and other major trading partners. The mobilisation and networking of relevant stakeholders, such as industrial organisations, public

⁶⁴ This topic is relevant to the whole Activity 2.3.

bodies, research organisations, ensures the effective dissemination and implementation of the developed standards. The usability of the product information list should be tested with target user groups, for which existing projects from the EU 7th Framework Programme and Competitiveness and Innovation Programme (CIP) may be taken into account.

Funding Scheme: Collaborative Project (large-scale integrating project).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.

Expected impact: Standards will reduce barriers to trade in bio-based products and expand the market potential and the competitiveness of European bio-based industry. Labels and an information list on bio-based products provide consumers and public procurers with clear information on these products' environmental performance, encouraging sustainable choices. Furthermore, the project will contribute to realising the objectives of different relevant European policy initiatives, including the Lead Market Initiative in Bio-based Products, the Industrial Policy, the Environmental Technology Action Plan and the EU Strategy for Key Enabling Technologies and the Bioeconomy Strategy.

KBBE.2013.3.3-04: Optimal and cost-effective industrial biocatalysts⁶⁵

Call: FP7-KBBE-2013-7 – single stage

Biocatalysis offers tangible benefits over conventional processes such as cost-efficiency, reduced use of solvents and lower energy requirement. The number of biocatalytic chemical transformations carried out at industrial scale has increased rapidly in the last decades. The full potential is far from being realised and there are high prospects to expand the range of reactions catalyzed by enzymes.

The aim of the topic is to expand the number/type of chemical transformations carried out by enzymes (isolated enzymes or whole cells) at industrial scale. The approach involves optimising enzymatic performance for a targeted reaction and in the industrial context in which it is to be applied.

Proposals should address the development of specific biocatalyst(s) that seamlessly meet the requirements of one or a limited number of targeted industrial processes. The approach could involve the recovery of novel biocatalysts (e.g. from available genomes and environmental metagenomes) and will address the development and implementation of technologies to produce biocatalysts that are suited to the rigours of the industrial environment (e.g. by use of directed evolution, computational technologies, *in silico* enzymes design, protein or cofactor engineering, etc). Downstream processes and methods for enzyme formulation and immobilisation are also to be developed, considering innovative reactor design and configuration.

Proposals will have a strong industry drive and include demonstration activities of the proposed concept to bridge the gap between lab and industrial scale and to prove the techno-economic viability of the targeted biotransformation. Proposals will aim to generate novel and competitive solutions, preferably with a potential application to other targeted enzymes and processes.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

The topic aims at financing a limited number of large collaborative projects within an overall maximum budget of EUR 20 000 000.

Additional eligibility criterion:

⁶⁵ This topic cuts across Area 2.3.3 Industrial Biotechnology: novel high added-value and Area 2.3.5 Environmental biotechnology.

- The estimated EU contribution going to SMEs shall be at least 25% of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: To move closer to industrial application those enzymatic biotransformations which are currently in a laboratory research phase. Enhancing the competitiveness and sustainability of the European biotech and chemical-using industry by the development of sustainable enzymatic biotransformation (e.g. with fewer steps, lower use of toxic reactants and solvents and efficient use of reagents). The project should contribute to the objectives of industrial and innovation policy, such as the EU Strategy for Key Enabling Technologies and the Lead Market Initiative on Bio-based products.

Area 2.3.4 Biorefinery

This Area addresses the development and application of industrial biotechnologies for the conversion of renewable raw materials into sustainable and cost-efficient bulk bio-products (e.g. chemicals such as lactic acid, biopolymers), and/or bio-energy. Regarding biofuels, the focus will be on the development of second generation biofuels with improved energy and environmental balance and which avoid the potential food/fuel conflict.

Aiming at achieving integrated and whole crop use of the biomass, biorefineries can use a broad range of biomass feedstocks, ranging from dedicated agricultural, aquatic, forest biomass chains to residues/waste and by-products of biomass-based industrial sectors.

Emphasis will be on the discovery, characterisation and development of novel enzymes and strains with optimised biocatalyst and microbial function for improved production of energy and bioproducts; characterisation of the structure and composition of the feedstock for optimised pre-treatment and fractionation of the biomass into its components; development of improved bio-processes with increased yield, quality and purity through bioprocess design, process optimisation and integration as well as downstream processing; fermentation science and engineering. Environmental and social aspects will also be incorporated.

KBBE.2013.3.4-01: Preventing and valorising bio-waste in biorefineries⁶⁶

Call: FP7-KBBE-2013-7 – single stage

The envisaged broad implementation of the biorefinery concept for the production of biochemicals, biomaterials and bioenergy will generate vast streams of by-products such as hemicelluloses, lignin, tall-oil, glycerol, etc. These fractions are currently widely underexploited as the focus has been placed on primary feedstock components more accessible for conversion. The sustainability and economic viability of the biorefinery concept call for the exploitation of by-products streams and the development of closed loop systems.

The objective of this topic is to develop biotechnology approaches for the conversion of biorefinery by-products into added value bio-based products, such as chemicals and chemical building blocks, biopolymers, materials, bioactive compounds. Research could also target the development of physico-chemical technologies which are concomitant to the enzymatic/microbial processes as well as sustainable downstream steps for product separation and purification. The feasibility of integrating the approach into a selected biorefinery value chain should be assessed.

Projects will have a strong industry drive and include demonstration activities aimed at proving the techno-economic viability of the developed technologies, including a quantitative technological/economic viability analysis for up-scaling to industrial production. A life-cycle assessment should be carried out in order to evaluate the environmental, economic and social

⁶⁶ This topic cuts across Area 2.3.4 Biorefinery, Area 2.3.3 Industrial Biotechnology: novel high added value bio-products and bio-processes and Area 2.3.5 Environmental biotechnology.

performance of the developed technologies building upon existing and on-going LCA activities in the field of bio-based products and processes.

Funding Instrument: Collaborative Project (large-scale integrating project targeted to SMEs).

The topic aims at financing a limited number of large collaborative projects within an overall maximum budget of EUR 12 000 000.

Additional eligibility criterion:

- The estimated EU contribution going to SMEs shall be at least 25% of the total requested EU contribution. This will be assessed at the end of the negotiation, before signatures of the Grant Agreement.

Expected impact: The economic efficiency and environmental performance of existing and future biorefineries will be enhanced. The projects will create a beneficial economic impact to the bio-based products sector and underpin partnerships and synergies across biorefinery related industrial sectors. The European added value lies in increasing the effectiveness and efficiency of the value chain of bio-based products by reducing losses and generating higher value products or services. The projects will contribute to implementing the objectives of several European policy initiatives, such as the Roadmap to a Resource-Efficient Europe, the Bioeconomy strategy, the Eco-innovation initiatives of the Environmental Technologies Action Plan and the Lead Market Initiative on Bio-based products.

Area 2.3.5 Environmental biotechnology

The concept of the KBBE implies environmental sustainability which will be promoted through the development and application of modern biotechnology.

Research and development activities will provide solutions for sustainable processes and products as well as for preventing and cleaning-up pollution. This will comprise the application of biotechnologies for the design, manufacture and use of more environmentally benign products and processes as well as for applications such as bio-sensors, bio-remediation, waste treatment and recycling⁶⁷.

In addition, this Area will also foster the application of modern biotechnology for the understanding of microbial biodiversity and ecology (e.g. bacterial cell-cell communication). This approach will expand the understanding on systematics and will lead to the unravelling of new genes, pathways etc. with the potential to enrich several of the biosynthetic domains of biotechnology. It will also serve to the purpose of cataloguing and therefore preserving microbial diversity.

KBBE.2013.3.5-01: New, fast, and reliable molecular detection methodologies

Call: FP7-KBBE-2013-7 – single stage

A number of issues require advancing the development of molecular detection methodologies for various applications, in particular related to: a) human pathogen presence and characterisation in foodstuffs, exemplified by the recent EHEC (Enterohaemorrhagic Escherichia Coli) crisis; b) compliance with EU legislation on GM food/feed (e.g. novel or marker-free GMOs); and c) customs and excise duty purposes, as specified by the Group of European Customs Laboratory (tobacco and other applicable groups of products). Up to now, molecular analytical techniques have become routine diagnostic tools in a broad range of sectors, like human and animal medicine, plant protection, food/feed traceability and remain relevant, especially PCR (Polymerase chain reaction) diagnostics or related Next Generation Sequencing approaches. In addition, optimal development and application of cost-efficient

⁶⁷ Where wastes can be regarded as feedstocks for bio-processing and biorefinery they shall be dealt with in the respective Areas (2.3.3 and 2.3.4).

DNA tools require maximal integration of methods supported through uniform minimal method performance parameters (MPP).

Proposals should aim at two major developments: firstly, to develop at least one new molecular detection method, including method validation for each of the applications mentioned under a-c) above; and secondly, to provide a scientific basis for the establishment of MPP for key molecular technologies: real-time PCR (including digital PCR, High resolution melting PCR) and Next Generation Sequencing (e.g. whole-genome sequencing, exon-sequencing, meta-genomics). Method development should be clearly justified on the basis of socio-economic and other applicable impact criteria. Proposals address in particular the demonstration of fitness of the methods for on-site application, equivalence to existing conventional standards, and potential benefits (e.g. to the food industry in terms of improved efficiency of food analysis). The MPP should be documented by benchmarking technological examples from diverse and representative sectors or be experimentally produced within the project. Particular attention should be paid to the inclusion of methodology support to decision making and to statistically documented uncertainties in the evaluation of the nature/presence of targets under suboptimal conditions (low target quality and/or quantity, stressed or non-culturable cell populations). Training for stakeholders and dedicated communication activities are considered essential.

Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs).

One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 3 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 25% of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: The development of at least 3 new highly sensitive detection tools in total, should significantly contribute to improving quality, safety, identity and traceability of bioeconomy products. It is expected that the selected project will not only address shortcomings of current methodologies used in the areas of consumer protection, customs procedures and excise duties, but will even more contribute to accelerate the use of fast and reliable detection tools in the most cost-effective manner. The development of urgently needed guidance, applicable across a number of areas, is expected to improve overall technological competence, and facilitate development of diagnostic tools and services in the future. It should support flexibility at the analytical, at quality assurance, quality control and at enforcement levels and improve communication between and across sectors.

KBBE.2013.3.5-02: GMO ERA-NET preparatory action⁶⁸

Call: FP7-KBBE-2013-7 – single stage

This topic will facilitate cooperation between European research funding bodies and the scientific community in the area of health, environmental and techno-economic effects of genetically modified organisms. It aims to provide the basis for an exchange of information and future collaboration in relation to a) facilitating stock taking and analysis of recent or ongoing research projects addressing a better understanding of the above mentioned effects of GMOs, with an emphasis on national projects in Member States; b) identification of future research priorities in this field and complementarities between activities at MS and international level; and c) creating a basis for developing possible future joint, transnational

⁶⁸ This topic is relevant to the whole Activity 2.3.

calls. Activities proposed in response to this topic should not interfere with GMO risk assessment activities as carried out by the European Food Safety Authority (EFSA). A formal consultation mechanism with the EFSA in this regard should be set-up. Formal consultation should also be set-up with the Joint Research Centre of the European Commission where relevant, e.g. with regard to socio-economic effects of GMOs.

The consortium should take into account complementarities with established and developing, relevant European initiatives (e.g. Standing Committee on Agricultural Research, European Technology Platform "Plants for the Future").

Funding scheme: Coordination and Support Action (coordinating action).

One project may be funded.

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 1 000 000 per proposal.

Expected impact: It is expected that this proposal will consolidate the basis for further coordination efforts between Member States; seek complementarities between national activities, and start pooling resources for funding and implementing future research activities in a synergistic manner.

Area 2.3.6 Emerging trends in biotechnology

Novel technologies and new trends in biotechnology will be instrumental for the rational advancement of the KBBE. Yet, not all future trends in enabling technologies and interdisciplinary research can be foreseen. However the potentials of e.g. meta-genomics, bioinformatics, systems biology, virtual cell, synthetic biology, and nano-biotechnology have become rather concrete. These and other fields deserve appropriate measures in terms of research and development to facilitate effective transfer and implementation into industrial applications.

KBBE.2013.3.6-01: Novel bioinspired materials and processes

Call: FP7-KBBE-2013-7 – single stage

The recent convergence of nanoscience and biotechnology has led to the development of entirely new class of materials, devices and technologies often nature-inspired and thus referred to as 'bioinspired' or 'biomimetic'. Nanobiotechnology is an emerging field with potential applications ranging from material, chemical and pharmaceutical industry to environmental technologies, and it has only recently entered the commercial exploration period.

The proposals under this topic should exploit the progress in nanobiotechnology in order to develop innovative bioinspired materials, devices and technologies. The approaches could entail both the biomimetic materials constituted of biological building blocks, as well as those based on innovative biotechnology processing. Research undertaken should give due consideration to the tailoring of the bioinspired materials/technology functionalities for given applications as well as to the industrial need of up-scaling the production. The proposals should include under the same umbrella at least two different approaches among which biomineralization, biologically produced nanometals and bioinspired polymers could be considered. Due consideration should also be given to potential environmental and health risks from a life-cycle perspective.

Dissemination of the results and activities to users, industries, firms (SMEs in particular) and citizens leading to a better exploitation of research and raising awareness of its potential should be taken on board within the proposals. Due consideration should also be given to potential environmental and health risks from a life-cycle perspective.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

One project may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 25% of the total requested EU contribution. This will be assessed at the end of the negotiation, before the signature of the Grant Agreement.

Expected impact: Research undertaken under this topic should contribute through step changes and solutions in nanobiotechnology. It is expected that they pave the way for future applications and markets thus strengthening competitiveness of European industry and SMEs. The projects should target one or several sectors (e.g. chemicals, pharmaceutical, environment, sensor technology) directly related to this high value added and fast growing field.

KBBE.2013.3.6-02: Synthetic Biology towards applications⁶⁹

Call: FP7-KBBE-2013-7 – single stage

The combination of engineering and biology that typifies the synthetic biology, makes it a multidisciplinary field of endeavour. Due its nature and multidisciplinary feature synthetic biology, in synergy with systems biology and metabolic engineering, has significant potential to influence, and transform a range of areas of our economy and society. Lately, its techniques matured and started to move from the bench to commercial applications. Thus, the projects under this topic should be industry driven, aiming on innovative approaches for different applications - industrial, health, environmental, energy, etc. Key challenges to be considered are the engineering of minimal cells, *de novo* design of robust and sustainable biomolecular circuits, orthogonal modules, synthetic pathways, new microorganisms and more robust metabolisms.

The development of synthetic biology brings with it a number of intellectual property issues, safety, ethical, societal and environmental implications. These are crucially important aspects that need to be identified and addressed by any proposal. Applicants should adhere to the Opinion No 25 of the European Group on Ethics in Science and New Technologies to the European Commission "Ethics of Synthetic Biology"⁷⁰.

Funding Scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

The topic aims at financing a limited number of large collaborative projects within an overall maximum budget of EUR 20 000 000.

Additional eligibility criterion:

- The estimated EU contribution going to SMEs shall be at least 15% of the total requested EU contribution. This will be assessed at the end of the negotiation, before the signature of the Grant Agreement.

Expected impact: The projects are expected to advance the research in the field of synthetic biology and to generate innovative tools and methods for biotechnology applications. The use of synthetic biology (also in combination with systems biology and metabolic engineering) for the development of engineered biological systems for a given application is expected to result in accelerated process design and reduced time-to-market. Furthermore, it is expected to result in scientific breakthroughs, which would increase the industrial competitiveness and would create new economic opportunities. The project results should be of interest and benefit to SMEs. A strong participation of SMEs and other representatives of the industry in the project itself should help contribute to the realisation of that benefit.

⁶⁹ This topic cuts across Area 2.3.6 Emerging trends in biotechnology and Area 2.3.3 Industrial Biotechnology: novel high added-value bio-products and bio-processes.

⁷⁰ http://ec.europa.eu/bepa/european-group-ethics/docs/opinion25_en.pdf

III IMPLEMENTATION OF CALLS

For description of the topics of the calls, please refer to section II 'Content of calls'

Call title: KBBE 2013

- **Call identifier:** FP7-KBBE-2013-7 – single stage
- **Date of publication**⁷¹: 10 July 2012
- **Deadline**⁷²: 05 February 2013 at 17.00.00, Brussels local time
- **Indicative budget**⁷³: EUR 341.35 million

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

Indicative budget breakdown:

Activity	Indicative amount ⁷⁴ (EUR million)
Activity 2.1: Sustainable production and management of biological resources from land, forest and aquatic environments	124.62
Activity 2.2: Fork to farm: Food (including seafood), health and well being	88.90
Activity 2.3: Life sciences, biotechnology and biochemistry for sustainable non-food products and processes	20.01 ⁷⁵
Topics (Group A): KBBE.2013.3.1-02; KBBE.2013.3.3-02; KBBE.2013.3.3-03; KBBE.2013.3.5-01; KBBE.2013.3.5-02; KBBE.2013.3.6-01	

⁷¹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁷² The Director-General responsible may delay this deadline by up to two months.

⁷³ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority. Figures are rounded to 2 decimal places.

⁷⁴ Figures are rounded to 2 decimal places.

⁷⁵ In case this budget can not be consumed (totally or partially) the corresponding budget will be allocated to the topics under Activity 2.3 – Call KBBE 2013 (group B);

	Topics: (Group B) KBBE.2013.3.1-01; KBBE.2013.3.2-02; KBBE.2013.3.3-01; KBBE.2013.3.3-04; KBBE.2013.3.4-01; KBBE.2013.3.6-02	107.82 ⁷⁶
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• **Topics called:**

Activity/ Area	Topics called	Funding Schemes and additional eligibility criteria
<u>Activity 2.1: Sustainable production and management of biological resources from land, forest and aquatic environments</u>		
Area 2.1.1 Enabling research	<i>KBBE.2013.1.1-01: Development and exploitation of genomic data and tools, phenotyping approaches and breeding concepts to sustainable animal production systems</i> <i>One project may be funded</i>	- Collaborative Project (large-scale integrating project targeted to SMEs) - The requested European Union (EU) contribution shall not exceed EUR 9 000 000 per proposal. - The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.
Area 2.1.2 Increased sustainability of all production systems (agriculture, forestry, fisheries and aquaculture); plant health and crop protection	<i>KBBE.2013.1.2-01: Agro-forestry systems for Europe</i> <i>One project may be funded</i>	- Collaborative Project (large-scale integrating project) - The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
	<i>KBBE.2013.1.2-02: Legume breeding and management for sustainable agriculture as well as protein supply for food and feed</i> <i>Up to two projects may be funded</i>	- Collaborative Project (large-scale integrating project targeted to SMEs). - The requested European Union contribution shall not exceed

⁷⁶ In case this budget can not be consumed (totally or partially) the corresponding budget will be allocated to the topics under Activity 2.3 – Call KBBE 2013 (group A);

		<p><i>EUR 5 000 000 per proposal.</i></p> <p><i>- The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.</i></p>
	<p><i>KBBE.2013.1.2-03: Integrated approach towards small grain cereal production and diversification in Europe</i></p> <p><i>Up to two projects may be funded, one targeting in particular 'major' small grain cereal crops (Triticum aestivum, Hordeum vulgare) and one in particular 'minor' small grain cereal crops (all others except rice; pseudo cereals are equally excluded). Attribution of proposals to either category ('minor cereals' or 'major cereals') must be clearly highlighted by the applicants at the time of submission, either in the title or abstract of the proposal. Therefore, in the ranking list, the highest ranked proposal for each category will have precedence over the following proposals from the other category even if it obtains a lower score.</i></p>	<p><i>- Collaborative Project (large-scale integrating project targeted to SMEs).</i></p> <p><i>- The requested European Union contribution shall not exceed EUR 5 000 000 per proposal.</i></p> <p><i>- The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.</i></p>
	<p><i>KBBE.2013.1.2-04: Control of pests and pathogens affecting fruit crops</i></p> <p><i>One project may be funded</i></p>	<p><i>- Collaborative Project (large-scale integrating project targeted to SMEs).</i></p> <p><i>- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.</i></p> <p><i>- The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.</i></p>
	<p><i>KBBE.2013.1.2-05: Biological control agents in agriculture and forestry for effective pest and</i></p>	<p><i>- Collaborative Project (large-scale integrating project targeted to SMEs).</i></p>

	<p><i>pathogen control</i></p> <p><i>One project may be funded</i></p>	<ul style="list-style-type: none"> - <i>The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.</i> - <i>The estimated EU contribution going to SMEs shall be at least 35% of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.</i>
	<p><i>KBBE.2013.1.2-06: Improved coordination and collaboration for EU Plant Health reference collections</i></p> <p><i>One project may be funded</i></p>	<ul style="list-style-type: none"> - <i>Coordination and Support Action (coordinating action).</i> - <i>The requested European Union contribution shall not exceed EUR 500 000 per proposal.</i>
	<p><i>KBBE.2013.1.2-07: Novel practices and policies for sustainable wood mobilisation in European forests</i></p> <p><i>One project may be funded</i></p>	<ul style="list-style-type: none"> - <i>Collaborative Project (large-scale integrating project targeted to SMEs).</i> - <i>The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.</i> - <i>The estimated EU contribution going to SMEs shall be at least 25 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.</i>
	<p><i>KBBE.2013.1.2-08: Innovative insights and tools to integrate the ecosystem-based approach into fisheries advice</i></p> <p><i>One project may be funded</i></p>	<ul style="list-style-type: none"> - <i>Collaborative Project (large-scale integrating project targeted to SMEs).</i> - <i>The requested European Commission contribution shall not exceed EUR 6 000 000 per proposal.</i> - <i>The estimated EU contribution going to SMEs shall be at least 15% total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.</i> - <i>The duration of the proposed project shall be maximum 4 years.</i>

	<p><i>KBBE.2013.1.2-09: Diversification of fish species and products in European aquaculture</i></p> <p><i>One project may be funded</i></p>	<ul style="list-style-type: none"> - Collaborative Project (large-scale integrating project targeted to SMEs). - The requested European Union contribution shall not exceed EUR 9 000 000 per proposal. - The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement. - The duration of the proposed project shall be minimum 5 years.
	<p><i>KBBE.2013.1.2-10: Boosting the domestication of established farmed finfish species through selective breeding</i></p> <p><i>One project may be funded</i></p>	<ul style="list-style-type: none"> - Collaborative Project (large-scale integrating project targeted to SMEs). - The requested European Union contribution shall not exceed EUR 6 000 000 per proposal. - The estimated EU contribution going to SMEs shall be at least 25 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement. - The duration of the proposed project shall be minimum 4 years.
	<p><i>KBBE.2013.1.2-11: Assessment of organic aquaculture for further development of European regulatory framework</i></p> <p><i>One project may be funded</i></p>	<ul style="list-style-type: none"> - Coordination and Support Action (supporting action). - The requested European Union contribution shall not exceed EUR 1 500 000 per proposal. - The duration of the proposed project shall be minimum 3 years.
<p>Area 2.1.3 Optimised animal health, production</p>	<p><i>KBBE.2013.1.3-01: Emerging viral vector borne diseases</i></p>	<ul style="list-style-type: none"> - Collaborative Project (small or medium-scale focused research

<p>and welfare across agriculture, fisheries and aquaculture</p>	<p><i>One project may be funded</i></p>	<p><i>project targeted to SMEs)</i></p> <ul style="list-style-type: none"> - <i>The requested European Union contribution shall not exceed EUR 3 000 000 per proposal.</i> - <i>The estimated EU contribution going to SMEs shall be at least 20 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.</i>
	<p><i>KBBE.2013.1.3-02: Sustainable apiculture and conservation of honey bee genetic diversity</i></p> <p><i>One project may be funded</i></p>	<ul style="list-style-type: none"> - <i>Collaborative Project (large-scale integrating project targeted to SMEs)</i> - <i>The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.</i> - <i>The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.</i>
	<p><i>KBBE.2013.1.3-03: Sustainable animal production: an integrated and multi-factorial approach</i></p> <p><i>One project may be funded</i></p>	<ul style="list-style-type: none"> - <i>Collaborative Project (large-scale integrating project targeted to SMEs).</i> - <i>The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.</i> - <i>The estimated EU contribution going to SMEs shall be at least 20 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.</i>
	<p><i>KBBE.2013.1.3-04: Coordination of research between EU and China on major infectious diseases of animals and zoonoses</i></p> <p><i>One project may be funded</i></p>	<ul style="list-style-type: none"> - <i>Coordination and Support Action (coordinating action).</i> - <i>The requested European Union contribution shall not exceed EUR 1 000 000 per proposal.</i> - <i>Minimum number of participants: 3 independent legal entities from different Member</i>

		<i>States or Associated Countries and 1 from China.</i>
	<i>KBBE.2013.1.3-05: Ecology of drug resistant bacteria and transfer of antimicrobial resistance throughout the food chain</i> <i>One project may be funded</i>	<ul style="list-style-type: none"> - Collaborative Project (large-scale integrating project targeted to SMEs). - The requested European Union contribution shall not exceed EUR 9 000 000 per proposal. - The estimated EU contribution going to SMEs shall be at least 15 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.
Area 2.1.4 Socio-economic research and support to policies	<i>KBBE.2013.1.4-07: Boosting the translation of FP projects' results into innovative applications in the field of agriculture, forestry, fisheries and aquaculture</i> <i>Up to six projects may be funded</i>	<ul style="list-style-type: none"> - Collaborative Project (small or medium-scale focused research project targeted to SMEs) - The requested European Union contribution shall not exceed EUR 1 000 000 per proposal. - The estimated EU contribution going to SMEs shall be at least 50 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement. - The duration of the proposed project shall be maximum 2 years.
	<i>KBBE.2013.1.4-08: Boosting the outreach of research with focus on agricultural and forestry knowledge and innovation systems</i> <i>Up to one project may be funded</i>	<ul style="list-style-type: none"> - Collaborative Project (small or medium-scale focused research project) - The requested European Union contribution shall not exceed EUR 3 000 000 per proposal.
	<i>KBBE.2013.1.4-09: Improving the capacity of agro-meteorological crop modelling to integrate climatic variability and extreme weather events</i> <i>One project may be funded</i>	<ul style="list-style-type: none"> - Collaborative Project (small or medium-scale focused research project). - The requested European Union contribution shall not exceed EUR 2 000 000 per proposal.
	<i>KBBE.2013.1.4-10: Agriculture and trade development in EU's Eastern</i>	- Collaborative Project (small or medium-scale focused research

	<i>Neighbours</i> <i>One project may be funded</i>	<i>project).</i> <i>- The requested European Union contribution shall not exceed EUR 2 000 000 per proposal.</i>
	<i>KBBE.2013.1.4-11: Measurement of research impact in European agriculture</i> <i>One project may be funded</i>	<i>- Collaborative Project (small or medium-scale focused research project).</i> <i>- The requested European Union contribution shall not exceed EUR 2 000 000 per proposal.</i>
	<i>KBBE.2013.1.4-12: Support to agricultural policy - Establishing and testing farm-level indicators</i> <i>One project may be funded</i>	<i>- Collaborative Project (small or medium-scale focused research project).</i> <i>- The requested European Union contribution shall not exceed EUR 3 000 000 per proposal.</i>
<u>Activity 2.2 Fork to farm: Food (including seafood), health and well being</u>		
Area 2.2.1 Consumers	<i>KBBE.2013.2.1-01: Impact of food and nutritional behaviour, lifestyle and the socio-economic environment on depression and proposed remedial actions</i> <i>One project may be funded</i>	<i>- Collaborative Project (large-scale integrating project).</i> <i>- The requested European Union contribution shall not exceed EUR 9 000 000 per proposal</i>
Area 2.2.2 Nutrition	<i>KBBE.2013.2.2-01: New technologies to study brain function in relation to eating behaviour</i> <i>One project may be funded</i>	<i>- Collaborative Project (large-scale integrating project).</i> <i>- The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.</i>
	<i>KBBE.2013.2.2-02: Factors influencing the human gut microbiome and its effect on the development of diet-related diseases and brain development</i> <i>One project may be funded</i>	<i>- Collaborative Project (large-scale integrating project).</i> <i>- The requested European Union contribution shall not exceed EUR 9 000 000 per proposal</i>
	<i>KBBE.2013.2.2-03: Food-based solutions for eradication of vitamin D deficiency and health promotion throughout the life cycle</i> <i>One project may be funded.</i>	<i>- Collaborative Project (large-scale integrating project)</i> <i>- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.</i>
Area 2.2.3 Food processing	<i>KBBE.2013.2.3-01: Development and industrial application of sensors for food processing operations</i>	<i>- Collaborative Project (small or medium-scale focused research project targeted to SMEs).</i>

	<i>Up to three projects may be funded</i>	<ul style="list-style-type: none"> - <i>The requested European Union contribution shall not exceed EUR 3 000 000 per proposal.</i> - <i>The estimated EU contribution going to SMEs shall be at least 20 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.</i>
	<p><i>KBBE.2013.2.3-02: Network for the transfer of knowledge on traditional foods to SMEs</i></p> <p><i>Up to two projects may be funded</i></p>	<ul style="list-style-type: none"> - <i>Coordination and Support Action (supporting action).</i> - <i>The requested European Union contribution shall not exceed EUR 4 000 000 per proposal</i>
Area 2.2.4 Food quality and safety	<p><i>KBBE.2013.2.4-01: Assuring quality and authenticity in the food chain</i></p> <p><i>One project may be funded</i></p>	<ul style="list-style-type: none"> - <i>Collaborative Project (large-scale integrating project).</i> - <i>The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.</i>
Area 2.2.5 Environmental impacts and total food chain	<p><i>KBBE.2013.2.5-01: Assessment of the impact of global drivers of change on Europe's food security</i></p> <p><i>One project may be funded</i></p>	<ul style="list-style-type: none"> - <i>Collaborative Project (small or medium-scale focused research project).</i> - <i>The requested European Union contribution shall not exceed EUR 4 000 000 per proposal.</i>
	<p><i>KBBE.2013.2.5-02: Saving water and energy for resource-efficient food processing</i></p> <p><i>Up to three projects may be funded</i></p>	<ul style="list-style-type: none"> - <i>Collaborative Project (large-scale integrating project targeted to SMEs).</i> - <i>The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.</i> - <i>The estimated EU contribution going to SMEs shall be at least 20 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.</i>
Area 2.2.6 European Research Area	<p><i>KBBE.2013.2.6-01: Exploitation of results of Framework Programme projects in food, health and well-being by small and medium-sized enterprises</i></p>	<ul style="list-style-type: none"> - <i>Collaborative Project (small or medium-scale focused research project targeted to SMEs)</i> - <i>The requested European Union contribution shall not exceed</i>

	<i>Up to five projects may be funded</i>	<p><i>EUR 2 000 000 per proposal.</i></p> <ul style="list-style-type: none"> - <i>The estimated EU contribution going to SMEs shall be at least 75 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.</i>
<u>Activity 2.3 Life sciences, biotechnology and biochemistry for sustainable non-food products and processes</u>		
Area 2.3.1 Novel sources of biomass and bioproducts	<p><i>KBBE.2013.3.1-01: Plant High Value Products - from discovery to final product</i></p> <p><i>The topic aims at financing a limited number of large collaborative projects within an overall maximum budget of EUR 20 000 000</i></p>	<ul style="list-style-type: none"> - <i>Collaborative Project (large-scale integrating project targeted to SMEs)</i> - <i>The estimated EU contribution going to SMEs shall be at least 25% of the total requested EU contribution. This will be assessed at the end of the negotiation, before the signature of the Grant Agreement.</i>
	<p><i>KBBE.2013.3.1-02: EU-Latin America Partnering Initiative on sustainable biodiversity in agriculture</i></p> <p><i>One project may be funded</i></p>	<ul style="list-style-type: none"> - <i>Coordination and Support Action (coordinating action)</i> - <i>The requested European Union contribution shall not exceed EUR 1 000 000 per proposal.</i> - <i>Minimum number of participants: 3 independent legal entities from different Member States or Associated countries and 3 from different ICPC countries from Latin America.</i>
Area 2.3.2 Marine and fresh-water biotechnology (blue biotechnology)	<p><i>KBBE.2013.3.2-02: The CO2 algae biorefinery</i></p> <p><i>The topic aims at financing a limited number of large collaborative projects within an overall maximum budget of EUR 20 000 000</i></p>	<ul style="list-style-type: none"> - <i>Collaborative Project (large-scale integrating project targeted to SMEs)</i> - <i>The estimated EU contribution going to SMEs shall be at least 25% of the total requested EU contribution. This will be assessed at the end of the negotiation, before the signature of the Grant Agreement.</i>
Area 2.3.3 Industrial biotechnology: novel high added-value bio-products and	<p><i>KBBE.2013.3.3-01: Support for demonstrating the potential of biotechnological applications</i></p> <p><i>The topic aims at financing a limited number of large collaborative</i></p>	<ul style="list-style-type: none"> - <i>Collaborative Project (large-scale integrating project)</i> - <i>The requested EU contribution shall be restricted to demonstration activities, other</i>

bio-processes	<i>projects within an overall maximum budget of EUR 20 000 000</i>	<i>activities and management</i>
	<i>KBBE.2013.3.3-02: Bioeconomy and bioregions</i> <i>One project may be funded</i>	- <i>Coordination and Support Action (supporting action).</i> - <i>The requested European Union contribution shall not exceed EUR 1 000 000 per proposal.</i>
	<i>KBBE.2013.3.3-03: Opening markets for bio-based products: Standardisation, labelling and procurement</i> <i>One project may be funded</i>	- <i>Collaborative Project (large-scale integrating project).</i> - <i>The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.</i>
	<i>KBBE.2013.3.3-04: Optimal and cost-effective industrial biocatalysts</i> <i>The topic aims at financing a limited number of large collaborative projects within an overall maximum budget of EUR 20 000 000</i>	- <i>Collaborative Project (large-scale integrating project targeted to SMEs)</i> - <i>The estimated EU contribution going to SMEs shall be at least 25% of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.</i>
Area 2.3.4 Biorefinery	<i>KBBE.2013.3.4-01: Preventing and valorising bio-waste in biorefineries</i> <i>The topic aims at financing a limited number of large collaborative projects within an overall maximum budget of EUR 12 000 000</i>	- <i>Collaborative Project (large-scale integrating project targeted to SMEs).</i> - <i>The estimated EU contribution going to SMEs shall be at least 25% of the total requested EU contribution. This will be assessed at the end of the negotiation, before signatures of the Grant Agreement.</i>
Area 2.3.5 Environmental biotechnology	<i>KBBE.2013.3.5-01: New, fast, and reliable molecular detection methodologies</i> <i>One project may be funded</i>	- <i>Collaborative Project (small or medium-scale focused research project targeted to SMEs).</i> - <i>The requested European Union contribution shall not exceed EUR 3 000 000 per proposal.</i> - <i>The estimated EU contribution going to SMEs shall be at least 25% of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of</i>

		<i>the Grant Agreement.</i>
	<i>KBBE.2013.3.5-02: GMO ERA-NET preparatory action</i> <i>One project may be funded</i>	- <i>Coordination and Support Action (coordinating action).</i> - <i>The requested European Union contribution shall not exceed EUR 1 000 000 per proposal.</i>
Area 2.3.6 Emerging trends in biotechnology	<i>KBBE.2013.3.6-01: Novel bio inspired materials and processes</i> <i>One project may be funded</i>	- <i>Collaborative Project (large-scale integrating project targeted to SMEs).</i> - <i>The requested European Union contribution shall not exceed EUR 9 000 000 per proposal.</i> - <i>The estimated EU contribution going to SMEs shall be at least 25% of the total requested EU contribution. This will be assessed at the end of the negotiation, before the signature of the Grant Agreement.</i>
	<i>KBBE.2013.3.6-02: Synthetic Biology towards applications</i> <i>The topic aims at financing a limited number of large collaborative projects within an overall maximum budget of EUR 20 000 000</i>	- <i>Collaborative Project (large-scale integrating project targeted to SMEs)</i> - <i>The estimated EU contribution going to SMEs shall be at least 15% of the total requested EU contribution. This will be assessed at the end of the negotiation, before the signature of the Grant Agreement.</i>

• **Eligibility criteria:**

- The general eligibility criteria are set out in Annex 2 of this work programme. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- The budget limits and other eligibility criteria indicated in the above table are strict eligibility criteria.
- Table of standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation and in the below format apply to all topics, unless indicated otherwise in the table above:

Funding scheme	Minimum conditions
Collaborative Projects	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or

	AC
Coordination and Support Actions (coordinating action)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (supporting action)	At least 1 independent legal entity.

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Evaluation procedure:**

- The evaluation criteria and scoring scheme are set out in annex 2 of the work programme.
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

The Commission will instruct the experts to disregard any pages exceeding these limits.

The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).

- During the consensus stage of evaluation, if a proposal fails to achieve the threshold score for the first criterion (Scientific and/or Technological excellence) or the second criterion (Quality and efficiency of the implementation and the management), the evaluation of this proposal will be stopped.
- Proposals will be prioritised according to their scores in a single ranking list per budget line. The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme.
- There may be competition between proposals submitted on different topics and proposals submitted on the same topic within budget lines. This may result in some topics not being supported. A reserve list may be produced of projects that pass the evaluation but fall below the available budget in case additional budget becomes available.
- For topics indicating a maximum number of fundable projects, proposals will be selected in order of the ranking list until the limit of fundable projects is reached. Priority will then be given to the next best ranked proposals, again until the limit of fundable projects is reached. This procedure will be repeated until the limits of all topics or the overall budget of the activity is reached.
- For topics indicating a maximum budget per topic (KBBE.2013.3.1-01; KBBE.2013.3.2-02; KBBE.2013.3.3-01; KBBE.2013.3.3-04; KBBE.2013.3.4-01; KBBE.2013.3.6-02), proposals will be selected in order of the ranking list until the limit of one topic budget is reached. Priority will then be given to the next best ranked proposals, again until the limit of one topic budget is reached. This procedure

will be repeated until the limits of all topic budgets or the overall budget of the activity is reached.

- **Indicative timetable:** Evaluation results: approximately three months after the relevant deadline mentioned above. Grant agreement signature: it is estimated that the first grant agreements related to this call will be concluded in September – October 2013.
- **Consortia agreements:** Participants in Collaborative Projects (large-scale integrating projects) and Collaborative Projects (large-scale integrating projects targeted to SMEs) are required to conclude a consortium agreement. For other projects consortia agreements are not obligatory but recommended.
- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.
- **Flat rates to cover subsistence costs:** In accordance with Annex 3 to this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website: http://ec.europa.eu/research/participants/portal/page/fp7_documentation under 'Guidance documents for FP7 / Financial issues / Flat rates for daily allowances'.
- **Additional information concerning twinning of projects from call KBBE and related programmes in third countries:** with a view to promoting international cooperation with third countries that have signed bilateral S&T agreements with the European Union, initiatives for collaboration between projects under Theme 2 of FP7 and related research programmes in these third countries will be encouraged on the basis of mutual benefit and reciprocity. The Commission reserves the right to ask the coordinators of FP7 projects, during the grant agreement negotiations, to include collaboration activities with projects financed by these third countries. The costs of these activities are expected to be approximately 1% of the total European Union contribution to these projects. Parallel funding is expected from the related research programmes in the third countries for counterpart projects.
- For the topics which have a percentage of EU contribution going to SMEs as an eligibility criterion, a substantial involvement of SMEs will be considered under the 'Implementation' criterion.

Call title: "The Ocean of Tomorrow 2013"

- **Call identifier:** FP7-OCEAN-2013
- **Date of publication⁷⁷:** 10 July 2012
- **Deadline:** 07 February 2013 at 17.00.00, Brussels local time⁷⁸
- **Indicative budget⁷⁹:** EUR 55 million from the 2013 budget of which:
 - EUR 19 million from Theme 2 – Food, Agriculture and Fisheries, and Biotechnology (FAFB)
 - EUR 7 million from Theme 4 - Nanosciences, Nanotechnologies, Materials and new Production Technologies (NMP)
 - EUR 4 million from Theme 5 - Energy
 - EUR 15 million from Theme 6 – Environment (including climate change)
 - EUR 10 million from Theme 7 – Transport (including Aeronautics)

Indicative budget breakdown:

- The budget for this call is indicative. The final budget awarded to actions implemented through this call for proposals may vary:

Topic number	Indicative budget per topic (EUR million)
OCEAN.2013-1 Biosensors for real time monitoring of biohazard and man made chemical contaminants in the marine environment	15
OCEAN.2013-2 Innovative multifunctional sensors for in-situ monitoring of marine environment and related maritime activities	15
OCEAN.2013-3 Innovative antifouling materials for maritime applications	15
OCEAN.2013-4 Innovative transport and deployment systems for the offshore wind energy sector	10

- The final budget of the call may vary by up to 10% of the total value of the call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

- **Topics called:**

⁷⁷ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁷⁸ The Director-General responsible may delay this deadline by up to two months.

⁷⁹ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

The aim of this call is to promote the development of marine technology, in cooperation with technology providers and end-users in order to foster innovation.

The topics of this call are implemented jointly by Themes 2, 4, 5, 6 and 7 as mentioned above and have identical descriptions under each Theme. When applying for this call, please choose the relevant topic codes below:

<p align="center">Theme / Activity / Area implementing jointly 'The Ocean of Tomorrow 2013' Location of the call and topics descriptions</p>	<p align="center">Topics called</p>	<p align="center">Funding Scheme and eligibility criteria</p>
<p>Theme 2 – Food, Agriculture and Fisheries, and Biotechnology Area 2.1.5 Call "The Ocean of Tomorrow 2013"– Joining research forces to meet challenges in ocean management</p> <p>Theme 4 – Nanosciences, Nanotechnologies, Materials and new Production Technologies (NMP) Area NMP.4.2 Call "The Ocean of Tomorrow 2013" – Joining research forces to meet challenges in ocean management</p> <p>Theme 5 – Energy Area ENERGY.10.2 Horizontal Actions: Call "The Ocean of Tomorrow 2013" – Joining research forces to meet challenges in ocean management</p> <p>Theme 6 – Environment (including climate change) Challenge 6.2 Sustainable use and management of land and seas: Call "The Ocean of Tomorrow 2013" – Joining research forces to meet challenges in ocean management</p>	<p>OCEAN.2013-1 Biosensors for real time monitoring of biohazard and man made chemical contaminants in the marine environment</p> <p><i>Several projects may be funded</i></p>	<p>Collaborative Project</p> <p><i>The requested European Union contribution shall not exceed EUR 6 000 000 per proposal</i></p> <p><i>- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 25% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement.</i></p>
<p>Theme 6 – Environment (including climate change) Challenge 6.2 Sustainable use and management of land and seas: Call "The Ocean of Tomorrow 2013" – Joining research forces to meet challenges in ocean management</p> <p>Theme 7 – Transport (including Aeronautics) Call "The Ocean of Tomorrow 2013" - Joining research forces to meet challenges in ocean management</p>	<p>OCEAN.2013-2 Innovative multifunctional sensors for in-situ monitoring of marine environment and related maritime activities</p> <p><i>Several projects may be funded</i></p>	<p>Collaborative Project</p> <p><i>The requested European Union contribution shall not exceed EUR 6 000 000 per proposal</i></p> <p><i>- Projects will only be selected for funding on</i></p>

		<i>the condition that the requested EU contribution going to SMEs is 30% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement.</i>
	<p>OCEAN.2013-3 Innovative antifouling materials for maritime applications</p> <p><i>Several projects may be funded</i></p>	<p>Collaborative Project</p> <p><i>The requested European Union contribution shall not exceed EUR 8 000 000 per proposal</i></p> <p><i>- Projects will only be selected for funding on the condition that the requested EU contribution going to SMEs is 25% or more of the total requested EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement.</i></p>
	<p>OCEAN.2013-4 Innovative transport and deployment systems for the offshore wind energy sector</p> <p><i>Up to one project may be funded</i></p>	<p>Collaborative Project</p> <p><i>The requested European Union contribution shall not exceed EUR 10 000 000 per proposal</i></p>

• **Eligibility conditions:**

- The general eligibility criteria are set out in Annex 2 of this work programme. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- The budget limits and the minimum percentage of EU contribution going to SMEs indicated for each topic in the above table are eligibility criteria. Proposals not fulfilling these criteria will not be funded.
- Table of standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation and in the below format:

Funding scheme	Minimum conditions
Collaborative Projects	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

• **Evaluation procedure:**

- The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme.
- Proposal page limits: applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

The Commission will instruct the experts to disregard any pages exceeding these limits.

The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).

- The evaluation shall follow a single stage evaluation procedure. Proposals will be evaluated remotely with the consensus session being held in Brussels.
- A reserve list of projects will be established per topic to be used in case the negotiation for entering into a grant agreement fails.
- A ranked list will be drawn up for each topic.

Evaluation criteria and threshold:

Proposals are evaluated on the basis of the following three criteria: 1. Scientific and/or technological excellence 2. Implementation; 3. Impact. For each criterion marks will be given, with the possibility of 0.5 point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
Scientific and/or technological excellence	3/5

Implementation	3/5
Impact	3/5
Overall threshold required	10/15

Proposals which have been awarded the same score within a ranked list will be prioritised according to the scores they have been awarded for the criterion *Scientific and/or technological excellence*. When these scores are equal, priority will be based on scores for the criterion *Impact*. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme (e.g. presence of SMEs, international co-operation, public engagement).

The following points will be reflected in the evaluation:

- The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.
- The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.
- **Indicative evaluation and contractual timetable:**
 - Evaluation results: four months after the relevant deadline mentioned above.
 - Grant agreements signature: it is estimated that the first grant agreements related to this call will come into force by end 2013.
- **Consortia agreements:**

Participants are required to conclude a consortium agreement prior to grant agreement.
- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.
- **Flat rates to cover subsistence costs:** In accordance with Annex 3 to this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: https://ec.europa.eu/research/participants/portal/page/fp7_documents under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances.

IV OTHER ACTIONS⁸⁰ (not implemented through calls for proposals)

Support to policies - set up of a Bioeconomy Observatory:

The Bioeconomy is a relatively new concept. The EU is supporting its development according to the Communication “Innovating for sustainable growth: a Bioeconomy for Europe”⁸¹, however no instrument is yet available to monitor this process. The Strategy and the detailed action plan included in the Staff Working Document accompanying the Communication foresees the establishment of a Bioeconomy Observatory, to monitor systematically the evolution of bioeconomy markets and the impacts of policies and research and innovation actions. This action also prepares Horizon 2020, since the establishment of a Bioeconomy Observatory is mentioned under the Specific Programme of the societal challenge “Food security, sustainable agriculture, marine and maritime research and the bioeconomy”.

Research activities performed in the framework of the action should allow the Observatory to provide the following information, on a regular basis:

- data on the bioeconomy: size of the bioeconomy and its encompassing sectors, and performance indicators (e.g.: economic and employment indicators, innovation indicators, productivity indicators such as unit labour cost, indicators of social wellbeing, indicators of environmental quality, etc.)
- “technology watch” and “policy watch”, to follow the development of science and technology as well of policies related to the bioeconomy
- mapping of EU bioeconomy capacity
- mapping of market/regulation failures and needs for the bioeconomy
- status of the implementation of the bioeconomy action plan
- forward looking analysis at EU and worldwide levels supported by appropriate new or existing indicators and models assessing the economic, social, environmental evolutions of the bioeconomy

The research activities performed in the framework of the Bioeconomy Observatory should build on existing instruments developed by EU national and international organisations and on the results of relevant EU-funded project.

Funding scheme: grant to named beneficiary: Joint Research Centre, 1049 Brussels - Belgium

Indicative Budget: EUR 1 500 000

Duration: 3 years

Expected impact: the Bioeconomy Observatory should provide regular data and analysis for policy makers and stakeholders to monitor the development of the bioeconomy in order to support the implementation of the bioeconomy Strategy.

Monitoring and review:

All FP7 projects funded under Theme 2 (completed and in progress) should be evaluated in terms of their outcomes and the following impacts should be assessed: scientific and technological, socio- economic, environmental, innovation and EU added value.

This analysis should build on former ex-post evaluation and impact assessment experiences, in particular in terms of methodology, tools and mechanisms. A report, including several case studies should be produced and made publically available.

Funding scheme: Coordination and Support Action for the appointment of monitoring experts and expert-reviewers

⁸⁰ In accordance with Articles 14, 17 and 27 of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

⁸¹ COM(2012)60

Indicative budget: EUR 700 000

Expected impact: Ex-post evaluation of former EU actions should provide evidence and public information on the results and impacts of EU funded research and innovation in Food, Agriculture, Fisheries and Biotechnology and should help the design of future EU research and innovation actions with strong impacts.

Conferences/events:

In support of the implementation of the Strategy "Innovating for Sustainable Growth: a Bioeconomy for Europe", a Bioeconomy Stakeholders' Conference should provide opportunities for public awareness raising and for an informed dialogue on the progress of the bioeconomy, involving researchers, stakeholders, policy makers and the civil society at large across the whole bioeconomy value chain, addressing in particular bio-refining, and the potential for regions to develop smart specialisation strategies in this field. The issue of skills in a wider sectoral context could also be addressed. The organisation of such a Conference should build on efforts undertaken in this direction by the Italian Presidency of the Council of the EU.

Indicative budget: EUR 150 000

Funding scheme: Grant to named beneficiary: Italian Ministry of Education, University and Research, (MIUR), Viale Trastevere, 76/a; 00153 ROMA

Estimated date: grant agreement: second half of 2013; conference: second half of 2014

Communication activities on EU efforts for the bioeconomy and in support to innovation

Communication activities should be set in order to assure the continuity of the awareness campaign for the bioeconomy started in 2012. These activities should further contribute to highlight the added value and the impact of innovation aspects of EU-funded research in Food, Agriculture and Fisheries and Biotechnology as well as the international recognition of Europe's achievements and potential in research and innovation relevant for the bioeconomy.

In this respect, specific activities – such as public events, publications, audiovisual supports and/or web products, etc. – should be implemented, in line with those previously carried out, to communicate results of EU-funded research projects to stakeholders, the general public and media. In this way, an interactive debate should be created on the potential of the bioeconomy sectors through research, education and innovation for the promotion of more growth and employment. A particular attention should be paid to young people and their educational needs.

Number of contracts: one or more contracts may be signed with one or more contractors

Funding scheme: Public procurement: use of framework contracts or open call for tender (depending on the availability of framework contracts)

Indicative budget: EUR 450 000

Estimated time frame to launch activities: first half of 2013

V BUDGET

Theme Food, Agriculture and Fisheries, and Biotechnologies - Indicative budget

Activities	2013 ⁸² Budget EUR million ⁸³
Call FP7-KBBE-2013-7	341.35
Call FP7-OCEAN-2013	19.00
Call FP7-ERANET-2013-RTD ⁸⁴	17.00
Call FP7-ENERGY-2013-1 ⁸⁵	2.00
General activities (cf Annex 4) (details below)	3.19
Evaluations	1.70
Other actions: <ul style="list-style-type: none"> • Monitoring and reviews (EUR 0.70 million) • Actions implemented through public procurements, expert groups and grants to identified beneficiaries (EUR 2.10 million) 	2.80
Estimated total budget	387.04

General activities - Indicative budget

Activities	2013 ⁸⁶ Budget EUR million ⁸⁷
CORDIS	0.499
Experts (Evaluators and reviewers)	0.006
Research Organisations / Eureka	0.025
COST	2.657
Total	3.187

⁸² Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

⁸³ The Budget figures given in this table are rounded to two decimals points.

⁸⁴ Call fiche: see Annex 4 to the Cooperation work programme.

⁸⁵ Contribution from Theme FAFB to topic "ENERGY.2013.3.7.1: Developing regional and pan-European schemes for the sustainable delivery of non-food biomass feedstock in a pan-European integrated market", implemented by Theme ENERGY. Call fiche: see Work Programme 2013 – Cooperation Theme ENERGY

⁸⁶ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

⁸⁷ The Budget figures given in this table are rounded to three decimals points.

All budgetary figures given in this work programme are indicative. The final budgets may vary following the evaluation of proposals.

The final budget awarded to actions implemented through calls for proposals may vary:

- The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

For actions not implemented through calls for proposals:

- The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions;

The final budget awarded for all other actions not implemented through calls for proposals may vary by up to 10% of the indicated budget for these actions.

WORK PROGRAMME 2013

COOPERATION

THEME 3

ICT – INFORMATION AND COMMUNICATIONS TECHNOLOGIES

(European Commission C(2012)4536 of 09 July 2012)

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This work programme for the ICT theme of the FP7 Specific Programme 'Cooperation' defines the priorities for calls for proposals closing in 2013 and the criteria that will be used for evaluating the proposals responding to these calls.

The priorities reflect the input received from the Programme Committee, the ICT Advisory Group¹ (ISTAG), the European Technology Platforms² in ICT and other preparatory activities including workshops involving the main stakeholders.

¹ <http://cordis.europa.eu/fp7/ict/istag>

² <http://cordis.europa.eu/technology-platforms>

ICT - Information and Communication Technologies

1 Objective

Improving the competitiveness of European industry and enabling Europe to master and shape future developments in ICT so that the demands of its society and economy are met. Activities will continue to strengthen Europe's scientific and technology base and ensure its global leadership in ICT, help drive and stimulate product, service and process innovation and creativity through ICT use and value creation in Europe, and ensure that ICT innovations are rapidly transformed into jobs and growth for the benefits of Europe's citizens, businesses, industry and governments.

2 Policy and socio-economic context

This Work Programme defines the priorities for calls for proposals that will result in projects to be launched in 2013.

2.1 Transforming our society through ICT developments

Deep transformations are under way in our society. ICT innovations are both a driver and a support for these transformations. New enabling technologies and applications are emerging, which have the potential to promote cultural understanding between citizens, seed innovation in institutions and create competitive advantage for businesses in the future. These innovations include:

Internet and cloud computing technologies which will radically impact how citizens and businesses use technology and individuals live their lives. This process is already under way, but new developments and applications will accelerate this trend. We are moving from a business-driven culture to a more 'social-oriented' culture where user-generated innovation becomes more influential and models of production, social organisation and value creation are changing. The connection of everyday devices (eg. home appliances) or of more specialised equipment (eg. medical devices) to the internet, coupled with internet/cloud technologies will create innovations and new business opportunities.

In **Micro- and nano-electronics**, a clear trend is the connection of more devices to the cloud. In order to serve this trend, constant progress in miniaturisation of more powerful systems using less energy is needed. Furthermore the need for integration of more functionality on chips (eg. microsystems for health, automotive, food) is increasing in order to support new advanced capabilities. This will lead to more intelligent machines, systems and processes and will impact all sectors.

Advanced interfaces such as touch screens have already transformed how businesses and consumer interface with technology. However, this is just the beginning of a profound change of how we interact with computers. New 3D displays, augmented-reality and multisensory interfaces as well as more reliable multilingual speech recognition will accelerate this trend. This will continue to transform the information

and entertainment industry and all services industries such as for example the retail sector.

Developing **more intelligent and smart environments** e.g. making use of adaptive, learning, cognitive and bio-inspired systems as well as distributed and embedded control and sensing is an important avenue for the medium to long term development of ICT.

These novel technologies will continue to play an important role in providing **responses to major societal challenges** such as an ageing population, health and social care, sustainable energy, inclusion, education and security. The impact of ICT on social behaviours, on democratic processes and on creativity will continue to grow with the wider diffusion of **web-based social networking** and user generated content and services, driven by the roll-out of broadband. These developments will have an influence on policies and drive economic, societal and cultural development for the decades to come.

2.2 The need for a new approach towards innovation

Whilst European R&D in ICT and other key enabling technologies is generally strong, the translation of ideas arising from basic research into innovative products for global markets is the weakest link in European value chains. To boost future productivity and growth, it is critically important to generate breakthrough technologies and to translate them into innovations (new products, processes and services) which are taken up by the wider economy.

As proposed in the European Commission's Horizon 2020 Proposal, it is key for the success of EU industry to integrate research and innovation and to provide seamless and coherent funding from idea to market. Horizon 2020 will provide more support for innovation and activities close to the market, leading to a direct economic stimulus. A major objective will be to provide SMEs with adequate support in order to help them grow into world-leading companies. The ICT Work Programme 2013 will anticipate and prepare this agenda.

3 Strategy for Work Programme 2013

The final ICT Work Programme in FP7 will cover one year and will use the 2013 budget. It will ensure a certain degree of continuity in priorities and at the same time serve as a bridge to activities in Horizon 2020.

3.1 Completing the work engaged over the first 6 years of FP7

The ICT R&D challenges introduced at the beginning of FP7 express targets to be typically achieved in a mid- to long-term timeframe. They address the core technology and application areas of ICT R&D that will continue to be key challenges for the future. They therefore require a sustained effort until the end of the Framework.

Across all areas, a large part of the work foreseen in 2013 will ensure continuity and completion of activities launched since the start of FP7. This concerns for example networks and service infrastructures and in particular the third phase of the Future

Internet Public Private Partnership, activities in cognitive systems and in advanced components or advanced research in next generation healthcare systems (VPH). The support to the PPPs on Green Car, Smart Cities/Energy-Efficient Buildings and Factory of the Future, in collaboration with other DGs will also be continued.

3.2 Preparing the expected launch of Horizon 2020

The final WP for FP7 has also an important role to play in preparing for the new approaches proposed to be introduced in Horizon 2020. Activities in 2013 should already anticipate the adaptation of the strategy towards a more integrated approach between research and innovation, pilot some of the new approaches and prepare for the initiatives to be launched in 2014.

In several areas (e.g Components and systems, Future Internet PPP and Health and Ageing) activities have been reorganised in order to enable further integration and cross-fertilisation between technologies and applications and to favour interdisciplinary R&I activities by bringing together different research constituencies.

In order to prepare for a new major ICT activity on "Next Generation Computing" in H2020, various aspects of computing will be addressed in Challenges 1, 3, 6 and 12. The activities will be cross referenced and closely coordinated.

In the areas of robotics and photonics, activities in 2013 will support the preparation of Public Private Partnerships that are to be launched under H2020.

The area Future and Emerging Technologies (FET) trials a lighter submission process (Xtrack), aiming at a faster evaluation and a simpler project implementation. This pilot bridges to the implementation of the FET Open Scheme in H2020.

The expected launch of Horizon 2020 will imply a whole new level of cooperation with other research and policy DGs. In several areas, WP2013 will contribute to reinforcing the cooperation with other DGs in preparation of the next Framework, building in particular on the experience gained in jointly running the recovery package PPPs.

3.3 Involving more SMEs

SMEs are at the heart of innovation in ICT. They play a vital role with their capacities to generate new ideas and quickly transform these into business assets. This Work Programme provides major opportunities for innovative SMEs, both to finance R&D and innovate in their products and services offering, and to build strategic partnerships and operate in wider markets.

Significant opportunities exist for SME involvement in areas of high potential growth (such as photonics, security, embedded systems, and ICT for health and ageing) and in areas focusing on the development of innovative content and data analytics services.

In addition a specific technology take-up and innovation action has been developed to support SMEs in several areas under Components and Systems (see Objectives 3.2, 3.3, 3.4) and under Future Internet PPP (see Objective 1.8). Some areas also offer a lighter scheme for proposal submission, evaluation and contracting (see Objectives 1.8, 4.3 and FET-Open).

Horizontal activities on access to venture capital and supporting clusters and incubator environments for SMEs are also supported (see Objective 11.5).

3.4 Contributing to broader policy agendas

3.4.1 The European Cloud Partnership (ECP)

The ECP is designed to solve the challenges caused by fragmented markets and legislation in Europe for Cloud Computing. The approach is to harmonise public sector requirements for clouds across Member States or regions or across application areas (such as e-health, taxation, social benefit payments). The Private sector will benefit from the existence of such a harmonisation through better coherence of demand and supply.

The ECP will specify common requirements for Cloud systems, undertake standardisation and procure proof of concept and implementation solutions. The Commission will co-fund this initiative to help start building trustworthy Clouds, fit for Europe. In WP2013 Cloud-related research will be supported through Objectives 1.2 and 1.5. This will give an adequate technical base for a joint pre-commercial procurement supported through Objective 11.3 and under the auspices of the European Cloud Partnership.

3.4.2 European Innovation Partnership (EIP) on Active and Healthy Ageing (AHA)

Societies, individuals, health & social care systems and industries are increasingly looking for innovative solutions in order to meet the needs of the changing demographic environment. The EIP on Active and Healthy Ageing brings together a wide array of stakeholders. The partnership aims to increase the healthy lifespan of EU citizens by 2 years.

WP2013 will support the EIP AHA by addressing relevant actions of its strategic implementation plan. This will be done mainly in Challenge 5 through the 'Personalised health, active ageing, and independent living' Objective. Other activities may also contribute, provided that their application areas address active and healthy ageing. This could include the Future Internet PPP, Safe and smart Internet of Things and the Sensing Enterprise, Collective Awareness Platforms for Social Innovation, Robotics and Open Data.

3.4.3 Smart Cities

Smart Cities are identified as a target research and innovation area in Horizon 2020 under the challenge 'Secure Clean and Efficient Energy'. In order to prepare the constituency for Horizon 2020 the themes Energy and ICT have defined in a coordinated way a set of activities, in each respective Work-Programme, addressing jointly Smart Sustainable Cities. This Work Programme includes several activities that will contribute to the Smart Cities initiative. In particular the objective 'Optimising Energy Systems in Smart Cities' will focus on system integration and validation of ICT infrastructures for energy-efficient neighbourhoods for carbon-neutral cities. In addition objectives on 'A reliable, smart and secure Internet of Things for Smart Cities', 'Data Centres in an energy-efficient and environmentally

friendly Internet' and 'Integrated personal mobility for smart cities' will also support Smart cities technologies and applications.

3.5 Key Performance Indicators (KPIs)

To measure the impact of interventions at Programme and project level, it is important to identify upfront well-defined KPIs for the programme and expected impact at the project and challenge or domain level. At programme level, conventional KPIs such as peer-reviewed scientific publications, number of citations, patents, licensing indicators or number of contributions to standards are expected to cover most needs. At lower levels, expected impact sections systematically specify precise and, if possible and relevant, quantitative and measurable impacts.

4 Approach

4.1 A continuing commitment to Europe's presence in the basic ICT technologies and infrastructures

This Work Programme continues to build on European strengths, seizes opportunities in emerging fields and intervenes where public and EU support is needed to share risks and build partnerships. It addresses the following challenges:

Challenge 1: pervasive and trusted network and service infrastructures

Challenge 1 covers tools and platforms for novel Internet application development and deployment through the Public-Private Partnership on Future Internet. At the same time, key technological developments and large scale experimentation in networking, cloud computing, Internet of Things, Trustworthy ICT and connected and social media of the future are targeted.

Challenge 2: cognitive systems and robotics

Challenge 2 initiates a research and innovation agenda, aiming to develop artificial systems that operate in dynamic real life environments, reaching new levels of autonomy and adaptability. There is a strong focus on advanced robotics systems, given their potential to underpin the competitiveness of key manufacturing sectors in Europe and a wide range of innovative products and services across the economy, from home appliances to health, security, space and leisure.

Challenge 3: alternative paths to components and systems

Challenge 3 covers nano/microelectronics and photonics, the heterogeneous integration of these key enabling technologies and related components and systems, as well as advanced computing, embedded and control systems at a higher level. Energy- and cost efficiency as well as recycling/end of life issues are major drivers across the Challenge.

Challenge 4: technologies for digital content and languages

Challenge 4 aims at enabling individuals and small organisations to create quality content and innovative services and at allowing people to access and use online content and services across language barriers; it also aims at ensuring reliability of retrieval and use of digital resources across applications and platforms and at scaling up data analysis to keep pace with extremely large data volumes.

4.2 A new phase for ICT's contribution to major socio-economic challenges in Europe

WP2013 will address Europe's key socio-economic challenges such as:

Challenge 5: ICT for health, ageing well, inclusion and governance

Challenge 5 focuses on development of solutions that empower the individual to improve and manage personal life conditions and participation as a citizen, elderly, patient and consumer. Special emphasis will be given to productivity gains, customer satisfaction, and provision of new capabilities of public interest by spanning across health and social care systems and government and linking up to other areas of ICT R&D.

Challenge 6: ICT for a lower carbon economy

Challenge 6 concentrates on the development of ICT to achieve substantial efficiency gains in the distribution and use of key resources such as energy and water, as well as the application of ICT to decarbonise transport and make it safer. This incorporates the ICT contributions to the Public-Private Partnerships on Energy Efficient Buildings and on Green Cars: ICT for the fully electric vehicle.

Challenge 7: ICT for the Enterprise and Manufacturing

Challenge 7 will support industry in bringing together suppliers and users for experiments that target the broad uptake of ICT in all domains of manufacturing. Focus is on emerging innovative technologies and processes, which need to be validated and tailor-made for customer needs before being able to enter the market. Special emphasis is on strengthening European SMEs, both on the supply and on the demand side.

Challenge 8: ICT for learning and access to cultural resources

Challenge 8 will develop technologies and methodologies that enable people to learn more effectively and support the acquisition of new skills. It also supports production of more powerful and interactive tools for creative industries and anticipate future trends in research and innovation by encouraging interaction in and between different segments of the creative industries.

4.3 Future and Emerging Technologies (FET)

The FET scheme continues to act as the pathfinder for mainstream ICT research. It will lay new foundations for future ICT by exploring unconventional ideas that can challenge our understanding of the scientific concepts behind ICT and that can impact future industrial ICT research agendas. Hence, its priorities are influenced by new developments and emerging opportunities in a wide range of scientific areas, as well as by the need to nurture the emergence of novel, often multidisciplinary, European research communities. FET will operate with a Proactive and an Open scheme, including activities to support new talents and high-tech SMEs.

Included in the FET challenge are the proposals resulting from the FET Flagships preparatory phase, during which six selected topics are being developed. They should each propose a full fledged Flagship initiative, out of which two will be selected to be launched as FET Flagships, initially as a ramp-up phase under FP7.

4.4 Support to international cooperation

International cooperation in the programme aims to support European competitiveness and to jointly address, with other regions of the world, issues of common interest and mutual benefit, thereby also supporting other EU policies (sustainable development, environmental protection, disaster response, security etc).

International cooperation activities in this Work Programme have three main objectives: (1) to jointly respond to major global technological challenges by developing interoperable solutions and standards, (2) to jointly develop ICT solutions to major global societal challenges, and (3) to improve scientific and technological cooperation for mutual benefit.

This Work Programme includes priorities for coordinated calls for international cooperation with Brazil and Japan. It also includes a set of targeted opening of areas throughout the Challenges and FET, as well as horizontal international cooperation actions (cross-cutting for the whole programme) to foster international partnership building and support dialogues.

Standards are an important element in the field of international cooperation. Beyond access to additional research capability, international cooperation in the context of industrial research should have global consensus and standards as a main target, both for the elaboration of new standards and adoption of standards through implementation of research results.

4.5 Ensuring more efficient and higher quality public services through Pre-Commercial Procurement (PCP) in ICT

The ICT Theme includes new incentives to promote further cooperation between public authorities for getting new ICT solutions developed.

This Work Programme contains an Objective open to PCP proposals addressing ICT solutions for any domain of public sector needs (Objective 11.1), as well as Objectives focusing on PCPs in specific areas of public interest: ICT for Health (Objective 5.1), e-learning (Objective 8.2), Digital preservation (Objective 11.2) and Cloud Computing in the e-Government context (Objective 11.3).

4.6 Contributing to European and global standards

Standardisation is recognised as an important research outcome and as a visible way to promote research results. Contribution and active support to industrial consensus eventually leading to standards is strongly encouraged. Integrated Projects are a particularly important vehicle to promote research results through standardisation. Set up of project clusters are also encouraged so that industrial consensus can be facilitated across projects dealing with similar issues and so that smaller Specific Targeted Research Projects (STREPs) can also contribute to a collective effort.

4.7 Contribution to the general activities of the Cooperation Specific Programme

The ICT Theme supports activities such as the Cordis service, experts, EUREKA membership and the COST Programme.

4.8 Encouraging the use of Internet protocol version 6 (IPv6)

The deployment of IPv6 in Europe is of utmost significance as IPv4, with about 4 billion addresses, is not enough to keep pace with the continuing growth and evolution of the Internet. IPv6, with its wide range of addresses, provides a straightforward and long term solution to the address space problem.

Research projects wishing to have a durable impact on the ICT landscape and market should base their developments on future-proof networking technologies. They should therefore consider carefully the choice of the Internet Protocol in their design, and should utilise IPv6 whenever possible.

5 Links to related activities

5.1 Joint Technology Initiatives and Joint National Programmes

Joint Technology Initiatives (JTI) are a pioneering approach to pooling public and private efforts, designed to leverage more R&D investments from Member States, Associated Countries and industry.

The focus of the ENIAC JTI³ in nanoelectronics is on industrial application-driven developments addressing mainly next generation technologies in the 'More Moore' and 'More than Moore' domains. This complements activities under this Work Programme that essentially cover the 'Beyond CMOS' and more advanced 'More than Moore' domains preparing Europe for the design and manufacturing of the next generation components and miniaturised systems.

The ARTEMIS JTI⁴ focuses on developing industrial platforms for the development and implementation of embedded systems responding to industry requirements in specific application domains. This complements activities under this Work Programme that mainly cover new concepts, technologies and tools for engineering next generation systems characterised by wide distribution and interconnection, and responding, in addition to timeliness and dependability, to more stringent constraints in terms of size, power consumption, modularity and interactivity.

The Ambient Assisted Living (AAL)⁵ joint national programme covers market-oriented R&D on concrete ICT-based solutions for ageing-well with a time to market of 2-3 years, with a particular focus on involvement of SMEs. This complements activities under this Work Programme that focuses on integrating emerging ICT concepts with a 5-10 years time to market as well as essential research requiring larger scale projects at EU level, e.g. with strong links to standardisation.

³ www.eniac.eu

⁴ www.artemis-ju.eu

⁵ www.aal-europe.eu

The Eurostars⁶ Programme provides funding for market-oriented *R&D* specifically with the active participation of R&D-performing SMEs in high-tech sectors.

5.2 Links with other FP7 themes

Synergies are sought with other FP7 themes to ensure higher impact. This is achieved notably with the three jointly funded Public-Private Partnerships (PPPs) of the European Economic Recovery Plan: Energy Efficient Buildings, Factories of the Future, and Green Cars. These PPPs are supported within the relevant ICT Challenges. They will be called for separately in coordination with the other FP7 themes.

5.3 Links with other FP7 Specific Programmes

In addition to the ICT theme in the Cooperation Specific Programme, the ICT research and development community will also be able to benefit from the other specific programmes that are open to all research areas including the Ideas, People and Capacities Programmes.

In particular, support is provided to ICT-based research infrastructure (e-Infrastructure) under the Research Infrastructures part of the Capacities programme. This will provide higher performance computing, data handling and networking facilities for European researchers in all science and technology fields. Coordination between this activity and the ICT theme will ensure that the latest and most effective technology is provided to European researchers.

Additionally, support to ICT-related stakeholders and social actors is also provided under the 'Science in Society' part of the Capacities Work Programme for a Mobilisation and Mutual Learning Action Plan on Specific Challenge 5 '*ICT – Internet and Society*'. This topic deals namely with: '*Internet governance issues*', '*privacy in the internet world*' and '*IPR: new business models in an internet world and open innovation*'.

5.4 Links with the ICT part of the Competitiveness and Innovation Programme

The ICT theme in FP7 is one of the two main financial instruments in support of the Digital Agenda for Europe initiative that is the Union's policy framework for the information society. The other main financial instrument is the ICT specific programme within the Competitiveness and Innovation Programme (CIP). ICT in the CIP targets the wide uptake and best use of ICT by businesses, governments and citizens. ICT in FP7 and ICT in the CIP are therefore complementary instruments aiming at both progressing ICT and its applications.

6 Funding schemes

The activities supported by FP7 will be funded through a range of funding schemes as specified in Annex III of the FP7 decision. These schemes will be used, either alone or in combination, to fund actions implemented throughout FP7. The funding schemes used for the research objectives identified in this Work Programme are the following (see Appendix 2 for more details):

⁶ www.eurostars-eureka.eu

6.1 Collaborative Projects (CP)

Support to research projects carried out by consortia with participants from different countries, aiming at developing new knowledge, new technology, products, demonstration activities or common resources for research. The Funding Scheme allows for two types of projects to be financed: a) 'small or medium-scale focused research actions' (STREP), b) 'large-scale integrating projects' (IP).

STREPs target a specific research objective in a sharply focused approach while large scale integrating projects have a comprehensive 'programme' approach and include a coherent and integrated set of activities dealing with multiple issues.

Both instruments play an important and complementary role. With this Work Programme, the objective is to support a balanced portfolio of projects that will enable on one hand focused and agile scientific and technological exploration through STREPs and on the other hand concentration of efforts - where needed - through IPs.

To this end, an indicative budget distribution per instrument is specified for each objective and also to some extent per funding scheme. The distribution is based on the size of the available budget per objective and on the nature of the research needed to achieve the relevant target outcome and expected impact.

6.2 Networks of Excellence (NoE)

Support to Joint Programme of Activities implemented by a number of research organisations integrating their activities in a given field, carried out by research teams in the framework of longer term cooperation.

6.3 Coordination and Support Actions (CSA)

Support to activities aimed at coordinating or supporting research activities and policies (networking, exchanges, coordination of funded projects, trans-national access to research infrastructures, studies, conferences, etc). These actions may also be implemented by means other than calls for proposals. The Funding Scheme allows for two types of projects to be financed: a) 'Coordination Actions' (CA), b) 'Specific Support Actions' (SA).

6.4 Combination of Collaborative Projects and Coordination and Support Actions (CP-CSA)

CP-CSA involves a combination of the collaborative projects and coordination and support actions (CP-CSA) funding schemes. It enables therefore the financing, under the same grant agreement, of research, coordination and support activities. In this Work Programme, CP-CSAs requiring Pre-Commercial Procurement (PCP) will combine:

- Networking and coordination activities: for public bodies in Europe to cooperate in the innovation of their public services through a strategy that includes PCP.
- Joint research activities: related to validating the PCP strategy jointly defined by the public bodies participating in the action. This includes the exploration, through a joint PCP, of possible solutions for the targeted improvements in public sector

services, and the testing of these solutions against a set of jointly defined performance criteria.

This work programme specifies for each of the research objectives, the type(s) of funding scheme(s) to be used for the topic on which proposals are invited.

7 Content of Calls for Proposals

7.1 Challenge 1: Pervasive and Trusted Network and Service Infrastructures

Challenge 1 is designed with a long term perspective and with a strong focus on the **Internet of the future**, thereby underpinning future economic growth and competitiveness. The research topics in this work programme will build on past achievements with a view to developing future strengths.

It is proposed:

- i) To continue technological research on all basic building blocks of the Internet value and delivery chain, i.e. network technologies, digital media, services, security and Internet of objects. Driven by roadmap-based research it progresses the technological characteristics of systems and services.
- ii) To leverage new constituencies, in particular technological innovative industry and SMEs, focussing on new generations of web-based applications and services, in line with the Digital Agenda for Europe;
- iii) To redefine approaches towards future networked computing systems, laying the basis for the future European cloud computing strategy in all its dimensions, networks, services, security and content, and moving towards user-led applications that exploit both widely distributed devices and sensors and the power of clouds.
- iv) To combine technological and social innovation by investigating and experimenting new paradigms related to the Internet, both for future Internet architectures and holistic and multidisciplinary understanding of Internet developments.
- v) To take the Future Internet PPP into its third and final phase at which it will open up large-scale trials to new constituencies of innovative developers following an open innovation model.

Taking into consideration the need to future-proof the work to be done, all Challenge 1 proposals are expected to either use or design for IPv6, as appropriate.

In order to move towards an even more integrated, cross-challenges approach, proposals that address more than one objective may require coordinated evaluation and implementation.

Support actions for road-mapping, constituency building (Future Internet Assembly, ETPs, ...) and ERAnets should be envisaged to prepare the research community for an even more comprehensive approach bringing together research and innovation aspects of complementary challenges in Horizon 2020.

The objectives under this challenge are linked to the objectives under international cooperation (section 7.10), notably to the EU-Japan Co-ordinated Call detailed under objective ICT-2013.10.1.

Objective ICT-2013.1.1 Future Networks

The target is the development of future broadband (fixed and mobile) networks which will be energy-efficient, secure, and robust, and will use spectrum flexibly and efficiently. Future networks will be the infrastructure which connects the future Internet of people, content, clouds and things, and will meet the targets of the DAE (Digital Agenda Europe). The focus in WP2013 is on a restricted set of technology priorities, which are key to achieving the targets⁷.

- a) Next generation heterogeneous wireless and mobile broadband systems, based on flexible spectrum usage and reduced EMF and interference.
- b) High throughput low-latency infrastructures, based on dynamic all-optical networks and hybrid wireless and cable networks.
- c) Internet architectures enabling innovation in network virtualization, specifically through programmability of network functions and protocols.
- d) Tighter integration of satellite and terrestrial communications technologies, as a critical infrastructure, in particular for public safety/security applications.
- e) Coordination and support actions for (re)structuring the research effort in the sector.

Expected Impact

- Developing key enabling technologies for the future generations of the European high-speed broadband and mobile network infrastructure (factor of 10 overall capacity increase, plus factor of 10 radio efficiency increase).
- Improved flexibility and economic, spectral and energy efficiency of access/transport infrastructures. (factor of 4 reduction in watts/bit).
- Strengthened positioning of European industry in the fields of Future Internet technologies, mobile and wireless broadband systems, optical networks, and network management technologies.
- Contributions to standards and regulation as well as the related IPR.
- Adoption by network operators of integrated all-optical networks and of spectrum-flexible broadband wireless systems (by 2020).

Funding Schemes:

a), b), c), d): IP, STREP

e) CSA

Indicative budget distribution:

IP/STREP: EUR 46.5 million, of which a minimum of 50% to IPs and 30% to STREPs

CSA: EUR 2 million

Call:

FP7-ICT-2013-11

⁷ Photonic devices for communication networks supporting the overall vision and requirements of Objective 1.1 are developed in Objective 3.2.

Objective ICT-2013.1.2 Software Engineering, Services and Cloud Computing

Target Outcomes

- Delivering services in an effective, efficient and reliable manner across the future computing continuum embracing clouds, communicating objects, sensors and smart devices, possibly utilising open source approaches.
- Build upon Europe's industrial strength in software and services technologies as to exploit the potential of Internet-based services, including cloud computing and networked software.

This objective is linked to and complements Objective 3.4 Advanced computing, embedded and control systems.

a) Advanced computing architectures and software engineering for the cloud and beyond.

Implementation of computing architectures, patterns and programming models for the efficient and secure usage of heterogeneous and distributed computing resources spanning the smart device to the large data centre, building on European users' needs and advancing cloud architectures and standards.

b) Innovative software and tools for services

Innovative and self-adaptive Internet-based services using agile software technologies and tools for any phase of the service lifecycle and exploiting widely distributed computing architectures, large distributed data sets and smart sensors. This work should take into account the social, open and collaborative dimensions of software development and service provisioning, and be implemented by short duration projects.

c) Coordination and support actions

- Support for the adoption of cloud computing taking into account legal and socio-economics as well as technical issues.
- Support for global interoperability in software and services technologies, achieved through standardization and European and international cooperation.
- Promotion of Open Collaboration models in the scientific community and in the software development community.

Expected Impact

- Accelerating the development and deployment of cloud computing and internet services.
- Increasing Europe's ability to design and deliver innovative services with strong user engagement through better involvement of SMEs and individual researchers/developers.
- Strengthening the European software industry with the know-how to build complex services and big data management in a multi-layered cloud computing continuum.

- Where relevant, successful contribution to international standardization.

Funding Schemes:

- a), b): IP, STREP
c): CSA

Indicative budget distribution:

- IP/STREP: EUR 39 million, of which a minimum of 25% allocated to IPs and 25% to STREPs
- CSA: up to EUR 2.5 million

Call:

FP7-ICT-2013-10

Objective ICT-2013.1.3 Digital Enterprise

The work addresses new forms of enterprises with ad-hoc extensive connectivity of digital assets and enhanced business processes through integration of sensing capabilities.

Focus is on:

a) New models for the Digital Enterprise, based on new forms of business relations with valorisation of digital assets, big/public data, and supporting extended, virtual or agile enterprises in the Future Internet. Research targets innovative concepts, methods, architectures, systems and business models for new digital enterprise systems, including web entrepreneur businesses. Multiple intelligent interconnected entities (material and immaterial components, e.g. tweets, personal assistants, crowd-sourcing knowledge, natural interfaces, etc.) should be considered to support co-operation between people, business assets, devices, resources and services.

b) Applications for the Sensing Enterprise to enhance the global and physical context awareness of business systems through the development of applications services and solutions for the "Sensing Enterprise" supported by smart components. These components may be sensors, tags, intelligent agents, smart objects, etc. enabling a continuous awareness and improvement of business operations in a digital environment that will bring new business trends and models not possible otherwise.

c) Coordination and Support Actions

One CSA supporting the international road mapping, research coordination and policy activities aimed at the acceleration of new forms of Internet-based Enterprise innovation throughout Europe.

Expected Impact

- New models of business that support and enhance cooperative networking among the wide range of enterprise assets and artefacts through their entire lifecycle and enabled by sensing capabilities of smart components.
- Take-up and use by European businesses of mobile connectivity and sensing technologies to increase flexibility and productivity by incorporating data from smart sensors directly into business processes.

Funding Schemes

a), b): STREPs

c): One CSA

Indicative budget distribution

- STREP: EUR 15.30 million
- CSA: EUR 0.70 million

Call:

FP7-ICT-2013-10

Objective ICT-2013.1.4 A reliable, smart and secure Internet of Things for Smart Cities

Target Outcomes

The goal is to facilitate wider uptake of IoT-based systems with an emphasis on sustainable smart city applications. The technological focus is on built-in privacy and security, and on scalable data management capabilities applicable to heterogeneous device platforms.

Focus is on:

a) **A reliable and secure Internet of Things**, based on security and privacy by design architectures and technologies for connected objects. Research covers integration of security and privacy by design with core functionalities (e.g., naming, addressing, routing) across the full data and information life cycle: data capture, storage, processing, delivery, exploitation, within a comprehensive IoT governance framework. It includes hardware coded safety and security. It takes into account the cross-application nature of objects supported by use cases in multiple fields such as smart home/spaces, smart living⁸, smart communities, and the emerging requirements of smart sustainable cities and related industrial applications.

b) **A smart Internet of Things** with scalable and adaptive middleware supporting data flows from sensing devices and a high quantity of object instances. It supports the Internet of Things as a heterogeneous network made up of federated private/public area networks composed of devices with different technological properties (virtualisation). It is complemented with event filtering and management capabilities.

For items a) and b) above, the technological work is expected to support intelligent information systems of smart cities. Smart city applications are thus expected to drive the requirements.

c) Coordination and Support Actions

One CSA covering: i) International road-mapping activity on the future of the Internet of Things about the integration of research results in various scientific and technological disciplines, including ICT, nanotechnology, biomedicine and cognitive

⁸ Where appropriate, smart living projects will contribute to the European Innovation Partnership (EIP) on "Active and Healthy Ageing", as defined in 3.4.2.

sciences, and their further applicability to smart city scenarios; ii) support to research coordination and policy activities of the Internet of Things European activities.

Expected Impact

- Scientific and technological models of resilient and reliable IoT applications supporting confidentiality, authenticity, and integrity of the data sensed and exchanged by smart objects.
- Technological and standardised solutions for IoT virtualised platforms supporting "green" and sustainable smart city applications.
- Enabling European suppliers to reach by 2020 a share of the IoT market above 30%.

Funding Schemes

a, b): STREPs

c): One CSA

Indicative budget distribution

- a, b): EUR 19.25 million.
- CSA: EUR 0.75 million

Call:

FP7-SMARTCITIES-2013

Objective ICT-2013.1.5 Trustworthy⁹ ICT

Target Outcomes

This objective addresses cyber security and privacy in three major technological areas: cloud computing, mobile services and the management of cyber incidents. Activities will cover R&D and innovation activities, including the adaptation and integration of technology and demonstration in real life environments, from the design to the implementation stage. This objective also aims at supporting trust and security policies.

This objective will be complemented with an EU-Japan co-ordinated call (see Objective 10.1) and foresees targeted support to EU-Australian cooperation in trustworthy broadband services.

a) Security and privacy in cloud computing

The solutions should be scalable, portable and robust against any type of failure. They should improve the security components, in particular for identification, authentication and encryption, in terms of speed of processing and easiness of

⁹ *Trustworthy* is defined in this context as: secure, reliable and resilient to attacks and operational failures; guaranteeing quality of service; protecting user data; ensuring privacy and providing usable and trusted tools to support the user in his security management.

deployment in highly distributed environments, with very large amounts of users. They should ensure the long-term privacy and security of data and applications, including when necessary through hardware solutions, and enhance user control (including on location of data) and usability. New models and tools for inter-domain security breaches detection, notification and reaction should be developed.

b) Security and privacy in mobile services

The efficiency, robustness and performance of the security solutions for mobile environments should be improved, in particular for system security (e.g. malware detection), data management and identification/authentication. They should address the specificities of the mobile devices (smart phone, tablet...) compared to traditional personal computers: lower resources (e.g. computational, power), different models of software development and distribution (e.g. applications marketplaces). They should include privacy-by-design and give to users the long-term control of the security and privacy of their data and processes, including notification for intentional or unintended breach. They should be scalable, inter-operable and applicable across technologies, vendors and operators.

c) Development, demonstration and innovation in cyber security

This activity addresses the application of technologies to increase the level of cyber security in Internet. This includes the development and demonstration of technologies, methodologies and processes to prevent, detect, manage and react to cyber incidents in real-time, and to support the breach notifications, improving the situational awareness and supporting the decision making process. It will also develop and demonstrate advanced technologies and tools that will empower users, notably individuals and SMEs, in handling security incidents and protecting their privacy.

d) Technologies and methodologies to support European trust and security policies

To be successful European strategies for internet security need to be complemented by the adoption of state-of-the-art technologies, processes and methods.

The proposed activities should:

- Develop a cyber security research agenda, including anticipation of future trends, directly inferred from the European strategies for internet security and addressing the needs for interoperability;
- Analyse the innovation process in privacy and cyber security technologies, identifying the obstacles and propose improvements; identify market conditions and economic incentives for organisations to invest in ICT security and integrate it into their products, services and systems;
- Facilitate the application of privacy and security by design practices in the development and implementation of products and services, foster a risk management culture among users and support an unhindered usage of Internet and other telecommunications technologies against arbitrary disruptions, censorship and surveillance.

e) EU-Australia cooperation on building user trust in broadband delivered services

This activity aims at developing and demonstrating an integrated framework for advanced authentication and identity management in broadband delivered services. The solution will rely on existing or emerging schemes, prototype components or recent research results. Where needed, additional components will be developed. The

system should provide assurance to the users of appropriate levels of security and privacy.

Expected Impact for Target Outcomes a), b), c) and d)

- Demonstration of secure and privacy-preserving technical solutions in clouds, mobile services and management of cyber incidents applying state-of-the-art research results, ensuring interoperability and compliance with privacy legislation.
- Widen take-up of research outcomes by service providers and wider adoption of ICT security solutions by European companies and users. Unlock the market restrictions, reveal the incentives to create a functioning cyber security market and increase the number of European spin offs in the field.
- Development and implementation of European strategies for internet security.
- Significant contribution to making Internet a medium that can be used to exercise human rights, including in hostile environments.

Expected Impact for Target Outcome e)

Demonstrate in a real-life environment the maturity and practicality of a digital authentication framework in broadband delivered services working across several jurisdictions (organisational, governmental) with high levels of assurance.

Funding Schemes

- a), and b): IPs, STREPs
- c): IP (up to one IP)
- d): CSAs (up to one CSA per bullet point)
- e): STREP (up to one STREP)

Indicative budget distribution

- IP/STREP: EUR 33.5 million, of which a minimum of 40% allocated to IPs and 30% to STREPs and up to 3 million for point e)
- CSA: up to EUR 3 million

Call:

FP7-ICT-2013-10

Objective ICT-2013.1.6 Connected and Social Media

This objective focuses on the development of advanced digital media access and delivery platforms and related technologies supporting innovation in the digital media sector. The aim is to develop a new generation of media clouds and Internet-based applications and services using intuitive and innovative ways of interacting with networked multimedia devices, applications and services (e.g. through enhanced immersive and interactive experiences).

Target Outcomes

a) Connected Media

- Architectures, technologies for the end-to-end coordination of user terminals (e.g. smart phones and smart devices), home-gateways, networks and cloud infrastructure for delivering highly interactive, personalised and shared media experiences. The work should link cloud-based applications, content delivery networks, peer-to-peer networking and media processing capabilities with content-aware and information-centric networks to allow flexible control over content storage, distribution and processing in an open networked platform.
- Novel platforms for customised and context-adapted hybrid broadcast-Internet services supporting the evolution of broadcasting media towards more interactivity, connectivity and integration with virtual, mixed and augmented realities, including next-generation multisensory games. The combination of multiple screens (of different types) and spatialised audio to augment user interaction, enhance flexible access and enable non-linear play-outs of interactive and user-centric media should be explored.
- Improvement of Quality of Experience by providing surrounding, immersive, multisensory and interactive, always connected and seamless environments on the move, at home and at work. Development of natural user-interaction interfaces and contextual adaptation techniques through smart profiling to provide dynamic user experiences. Increasing quality, frame rates, resolution and dynamic range for more plausible digital media experiences, integrating, notably by means of augmented reality, natural and computer generated AV content.

b) Social Media

- Technologies for intelligent dynamic media adaptation by delivery platforms, beyond the transcoding of individual streams, according to the context of individual consumers and social communities.
- Simplification of access to networked media services in order to broaden the involvement of social communities in crowd sourcing. Seamless and user-friendly interactive media experiences.
- Development of community-focused interactive media systems that facilitate a range of social interactions supported by user-, community-, network- and context-centric search based on effective relevance feedback and real-time social recommendation.
- Optimisation of media exchange according to community usage and interaction patterns extracted from the analysis of relationships and shared activity in social networks.. Extraction and mining of data from social networks, for indexing and searching user-generated content and for research on human behaviour and social activity.

c) Co-ordination and Support Actions

Coordination of stakeholders, and projects, identification of related policy measures to support open innovation, transfer from research to innovation and novel products to drive growth and jobs in Europe. This includes the development of integrated research and innovation roadmaps leading to the creation of business ecosystems.

Expected Impact

- Reinforced positioning of the European ICT and digital media industry and increased market opportunities, leveraging new constituencies, in particular technological innovative industry and SMEs.
- Stimulation of demand for high-performance, bandwidth-hungry media applications and services. Demonstration of the viability of new technologies and validation of innovative solutions through large scale demonstrations, pilots or testing of use cases as to guarantee sustainable deployment.
- Development of a true horizontal market and ecosystem for connected TV, interactive media applications and networked games, avoiding market fragmentation and locking-in of users and applications.
- Further development of social TV and social networks, especially in mobile environments, leveraging mixed (real and virtual) media as an enabler of a new generation of Internet-based applications and services.
- Greater creativity stimulated through technologies and tools to capture, produce, search and exchange professional and user generated immersive and interactive digital media content.

Funding Schemes

a), b): IP, STREP

c): CSA

Indicative budget distribution

- IP/STREP: EUR 32 million, with at least 70% for STREPs
- CSA: EUR 1.4 million

Call:

FP7-ICT-2013-10

Objective ICT-2013.1.7 Future Internet Research Experimentation

Target Outcomes:

The overall goal of Future Internet Research Experimentation (FIRE) is combining technological and social innovation by investigating and experimenting new paradigms related to the Internet, both for future Internet architectures and a holistic and multidisciplinary understanding of Internet developments.

The methodology proposed to maximise the social and economic impact of new technologies is based on an empirical approach, involving the creation of open experimental facilities in key research areas. Engineering systems that integrate computing and physical systems are encouraged.

In addition to the priorities identified in this objective, the objective will be complemented with an EU-Japan co-ordinated call (see Objective 10.1) and an EU-Brazil co-ordinated call (see Objective 10.2).

Specific objectives of FIRE in WP2013 are:

- a) To support new testbed facilities in areas not yet covered by existing ones, or to extend the most successful facilities, where success is to be measured in terms of the innovative nature of the usages, and number of users. The projects should reserve at least 50% of their budget for open calls addressing innovative usages, extensions and experiments, based on open software, open data infrastructures, open hardware, open standards and open platforms, including virtual ones. Pilots and experiments should be replicable, reusable and scalable. The selection criteria should be based on a combination of excellence and crowd-sourcing when possible.
- b) To support experimentally driven research, in particular to conduct multidisciplinary investigation of key techno-social issues (i.e. Internet Science), exploiting any relevant FIRE facilities, considering also benefits for citizens, ethical and sustainability aspects. Examples are network neutrality, privacy by design, identity management, security trade-offs, techniques to ensure free flow of information (e.g. circumventing censorship), cloudification, crowd-sourcing, reputation mechanisms, data ownership, data retrieval and openness, citizen involvement in content generation, new collective economic models for rewarding creators and talents, performance and quality of experience as perceived by final users and behavioural and societal changes. A multidisciplinary approach is encouraged to include beyond technologically oriented partners, also at least two participant entities with a main focus of activity addressing sociology, economy, law, content/culture, and/or perception/interfaces.
- c) CSAs to 1) identify, monitor, coordinate and integrate experimental-based research and large-scale deployment activities, at both European and National level, to promote the sharing of best practices, solutions, applications and services and 2) identify, monitor and publicize European and National Future Internet initiatives with a view to facilitate their coordination and integration as well as the broader use of their results and achievements across Europe.

d) **EU-South Africa** cooperation on future internet experimental research and testbed interconnection

This activity aims at improving the capabilities of testbeds on future internet technologies in Europe and in South Africa. The software developed in the research projects will be deployed and evaluated in the testing facilities in both, Europe and South Africa. To develop affordable technologies for future internet, research activities on delay tolerant networks and opportunistic communications are encouraged as well as developments supporting innovative applications for social integration.

South African organisations are expected to contribute a significant share of the funding they require for participation in this activity.

e) **EU-China** cooperation on future internet experimental research and IPv6

The goal is to build a partnership between European and Chinese organisations to foster cooperation in the domain of future internet research experimentation and IPv6.

This should include in particular:

- strengthening joint research efforts on the future internet by developing interoperable solutions and common standards.

- reinforcing academic and industrial cooperation on future internet experimental research, through a better networking between European and Chinese actors.
- exchanging good practices for IPv6 deployment and supporting the creation of interconnected IPv6 pilots between Europe and China.

Proposals are expected to build upon the achievements by similar past or ongoing projects.

f) **EU-South Korea** cooperation on future internet experimental research

This activity aims to develop experiments on individual testbeds but also across testbeds for understanding the management of heterogeneous resources, the access to these resources and the evaluation of their usage. It will exploit the links between current activities in Europe and in South Korea. Research will focus on software defined networking (SDN) enabling parallel deployment of slices assigned to virtual network providers. The software developed in the research project will be deployed and evaluated in the testing facilities in both, Europe and South Korea.

Expected impact for Target Outcomes a) and c):

- More cost efficient experimentation activities, with more diverse and larger scale testing. Higher number and broader range of experiments running in facilities.
- Broader end-user involvement, including interaction with the real world, leading to a better and faster exploitation of research results in infrastructures, products, services and social innovation mechanisms, being particularly important to obtain user feedback through advanced quality of experience monitoring techniques fully integrated in real scenarios.
- Broader and more innovative use of the Experimental Facilities by a significant number of Future Internet research projects in European and national programmes.

Expected impact for Target Outcomes b) and c):

- New techno-social models and business opportunities contributing to economic and sustainability goals, to be tested at large scale.
- Providing incentives for truly multidisciplinary exploration of new concepts and approaches to innovation and social innovation enabled by ICT tools and networks.

Expected impact for Target Outcome d):

- Advanced technological capabilities tested and validated at global scale
- Broader exchange of research outcomes and applications for social integration developed in European and South African programmes
- Novel technology for future internet access with a focus on interconnection and affordability, targeted to the needs of emerging countries

Expected impact for Target Outcome e):

- Reinforcement of partnerships in future internet experimental research.
- Increased visibility for EU future internet research activities in Asia.
- Facilitation of the emergence of common future internet standards.

Expected impact for Target Outcome f):

- World wide federation of testbeds for future internet research.
- Broader dissemination of the results in order to foster wide adoption, eventually going beyond testbed frameworks if appropriate.
- More durable culture of collaboration between European and South Korean actors.

Funding Schemes

- a) IPs
- b) STREPs
- c) CSAs
- d) STREP
- e) CSA
- f) STREP

Indicative budget distribution

- a) and b) IPs and STREPs: 16,5 M€ (min. 8 M€ for IPs, min. 8 M€ for STREPs)
- c) CSA: 0.5 M€
- d) STREP: 1 M€
- e) CSA: 0.5 M€
- f) STREP: 0.5 M€

Call:

FP7-ICT-2013-10

Future Internet Public Private Partnership (FI-PPP)

The objective of the third phase of the FI-PPP¹⁰ is (i) to provide and run a stable infrastructure for the large scale trials, expand the core platform, the use case specific functionalities and their demand-driven instantiations, and (ii) to involve through open calls SMEs and web-entrepreneurs as developers of highly innovative, infrastructure based, data-rich services and applications, building on, and extending, the large scale trials and the core platform functionalities. The third phase is an integral part of the FI-PPP and capitalises on the investments and developments of phase one and two.

All projects operating under the FI-PPP contribute and adhere to the governance structures in place and develop cooperation notably with CONCORD and FI-WARE¹¹. The third phase of the FI-PPP ensures that technological developments and

¹⁰ See the ongoing activities under the FI-PPP: www.fi-ppp.eu

¹¹ [Project website: www.fi-ware.eu](http://www.fi-ware.eu)

trials taking place in phases one and two will evolve into seed-type activities generating actual take-up of innovative Internet services and applications.

The FI-PPP should also be an accelerator for regional smart growth. Therefore this last phase of the FI-PPP is expected to connect and establish close synergies with regional developments and policies.

Objective ICT-2013.1.8 Expansion of Use Cases

Target Outcomes

A large set of innovative and technologically challenging services and applications in a wide range of Internet usage areas and large scale trials, making innovative use of the technologies and validating the concepts developed under the previous phases of the FI-PPP. These services and applications should make public service infrastructures and business processes significantly smarter (i.e. more intelligent, more efficient, more sustainable) through tight integration with Internet networking and computing capabilities, and notably exploiting open data.

Implementation requirements

This objective calls for projects with participants that can rapidly connect to existing communities of small and innovative ICT users and developers, i.e., SMEs and web-entrepreneurs, to take-up Future Internet technologies developed in previous phases.

Typically projects will bring together partners providing the full ecosystem to successfully involve the SMEs and web-entrepreneurs called to participate, such as partners having access to and experience with SME environments, partners bringing in the innovative ICT infrastructure, trial providers, the user notion, and the public sector to foster local/regional commitment.

Project participants, notably the coordinating organisation, will have to demonstrate their financial viability to receive and manage funds at the level requested, as well as their expertise and capacity, first and foremost in developing and managing the full life-cycle of the open-calls transparently. The projects are encouraged to ensure a sustainable longer-term environment. A combination with other innovation actions, supported by regional, national and European policies and funds, is highly desirable.

The task of projects is to:

i) scope, organise and manage open calls for small and innovative ICT players such as SMEs and web entrepreneurs to develop services/applications that present a clear societal and economic value while exceeding a defined minimum level of functional complexity and thus generating a very large number of small, innovative services, which build on technologies of the ongoing large scale trials and the FI-WARE Generic Enablers. Any IPR generated by the SMEs and web entrepreneurs shall rest with them.

ii) liaise with the other projects selected under this objective in defining the open calls, support SMEs and web entrepreneurs in terms of access to information, tools and services provided by the technology foundation extension selected under objective 1.8, notably on functionalities of the core platform toolbox, the test bed, the large scale trials, the infrastructure availability/accessibility and others, in order to get involved SMEs rapidly up to speed/familiarised with the FI-PPP environment and enable them to focus on their innovation task.

iii) coordinate and collaborate with programme support actions with regard to their offerings to SMEs, notably aiding SMEs and web entrepreneurs in aspects such as innovation, entrepreneurship and business modelling, training and education for and among entrepreneurs, business sustainability, intellectual property.

In addition, projects selected under this objective will link-up to the capacity building activity¹² of phase two of the FI-PPP.

At least 80% of the project budget should be reserved for open calls for SMEs and web-entrepreneurs. Projects must publish widely their open calls using the Commissions publishing channels for public calls¹³ and adhere to FP7 standards with respect to evaluation, conflict of interest and confidentiality. Projects must also promote widely the participation in their open calls, e.g., by tapping into venture capital communities and corporate venture activities, public/private accelerators and others. SMEs and web entrepreneurs that are successful in the open calls will be granted financial assistance which is typically in the order of EUR 50.000-150.000.

Speed and quality of service to SMEs and web entrepreneurs as well as their successful and sustainable involvement will be a key success measure.

Projects selected under this objective shall jointly set-up an innovation cluster bringing together relevant public sector and private/industrial actors, developers and users to ensure the sustainability of the developments under the FI-PPP, as well as to develop and contribute to a cooperative approach to identify good practices and success cases including dissemination.

Funding Schemes:

Up to 20 CP-CSAs, with a priority given to maximise the geographic and/or sectorial coverage.

Indicative budget distribution:

- EUR 100 million
- Duration: 24 months

Call:

FP7-ICT-2013-FI

Objective FLICT-2013.1.9 Technology Foundation Extension and Usage

Target Outcomes

a) Technology Foundation Extension

An updated and extended technology foundation should answer both the needs identified in the use case trials of phase two as well as the needs arising during the use case expansion in the third phase (see objective 1.8). Such needs include technological updates and improvements of existing core platform functionalities, i.e. generic enablers, and the development and implementation of additional enablers

¹² See the previous FP7 ICT work programme 2011/2012 objectives 1.8 and 1.9 -

http://cordis.europa.eu/fp7/ict/docs/3_2012_wp_cooperation_update_2011_wp_ict_en.pdf

¹³ I.e. the participants portal: <https://ec.europa.eu/research/participants/portal/page/cooperation>

across multiple domains, including work relevant for the adoption of common standards. Continuity with the FI-WARE project¹⁴, in particular with respect to intellectual property, is required.

b) Platform availability

The work must ensure the availability of the FI-PPP generic enablers for use in different infrastructures, in different regional contexts, and across different domains during the remaining lifetime of the FI-PPP, notably under phase 3 to all participants and possibly beyond. This includes support for the further extension and adaptation of these generic enablers to domain-specific instantiations, their reference implementation in open source, operational support for these instances, and the operation of a test infrastructure on generic enablers servicing several trials can be hosted. It particularly, as a service, it includes technological training of the SMEs and web-entrepreneurs involved under objective 1.8 on how to best use developed technologies and knowledge. The work should eventually integrate the achievements of the FI-PPP capacity building and infrastructure support activities (Objective FI-ICT-2011.1.9) of the previous phases.

c) Platform sustainability

Ensure sustainability of the core platform and of domain-specific platform developments in terms of usage and further evolution beyond the FI-PPP lifetime, including exploitation planning, standardisation, interoperability, IP arrangements and other measures maintaining their availability in the longer-term.

d) Usage and participation

While objective 1.8 focuses on the involvement of the take-up actors and direct, full-service support to them, this sub-objective provides for the necessary tools and support across all projects selected under objective 1.8 and the FI-PPP. This includes the provision of:

- support for SMEs and web-entrepreneurs in view of developing and sharing best practices, fostering entrepreneurship, access to finance, matchmaking between regional ecosystems and the financial community, innovation support for the various large-scale trial sites, benchmarking, mentoring, partnering with regional innovation actors, as well as monitoring and coordination across all trial sites and domains (Key Performance Indicators).
- Provide qualitative and quantitative evidence of the socio-economic impact of the activities under the Future Internet PPP until 2020.
- support for communications, networking and dissemination and exploitation activities such as developing success stories, road shows, conferences and presence at conferences and fairs to achieve significant visibility and attract further usage and exploitation using the latest multi-media and Internet tools.
- working with the FI-PPP community and beyond to support the creation, networking and development of Internet innovation hubs by bringing together web entrepreneurs, mentors, investors, students, academia, public sector innovators and industry – this action shall be carried out in collaboration with ongoing work of the EIT ICT Labs.

¹⁴ For details of the ongoing project FI-WARE see www.fi-ware.eu

- support for the future European Internet community to better link research to innovation through technology and business road-mapping (including in relation with activities in US, Japan, Canada and the BRICs), identification of new stakeholder groups, transfer of knowledge and best practices from the FI-PPP towards the larger FI community, including organising European-level conferences and workshops.

Expected Impact of the FI-PPP (the two objectives described above)

- Significant increase of the effectiveness of business processes and novel approaches to the operation of infrastructures and applications of high economic and/or societal value.
- Reinforcement of the European industrial capability for novel service architectures and platforms in view of new business models based on cross-sector industrial partnerships built around Future Internet value chains.
- Increased involvement of users and public authorities at local, regional and national levels.
- New opportunities for high-growth entrepreneurs and SME players to offer new products, equipments, services and applications.

Funding Schemes:

One IP which must cover a), b), c)

2-5 CSAs which cover d)

Indicative budget distribution:

- One IP: EUR 23 million. At least 10% of the budget is expected to be allocated through one open call to allow for adjustments in light of the projects selected under objective 1.8.
- CSAs: EUR 7 million
- Duration: 18-24 months

Call:

FP7-ICT-2013-FI-PPP

7.2 Challenge 2: Cognitive Systems and Robotics

Challenge 2 initiates a research and innovation agenda, aiming to develop artificial systems operating in dynamic real life environments, reaching new levels of autonomy and adaptability and interacting in a symbiotic way with humans.

There is a strong focus on advanced robotics systems, given their potential to underpin the competitiveness of key manufacturing sectors in Europe and a wide range of innovative products and services across the economy, from home appliances to leisure, agriculture, transport and logistics, inspection and security in dynamic environments. Robotics provides us also with important means to address Europe's societal challenges in areas like environment, health and ageing¹⁵. The work will build on and extend past achievements in scientific research and will also introduce a significant new effort aiming at the widespread introduction of robotics technology in manufacturing and service sectors.

An additional research focus targeted under this challenge will address symbiotic human-machine relations, which aims at a deeper understanding of human behaviour during interaction with ICT, going beyond conventional approaches.

The work on cognitive systems and smart spaces and on symbiotic human-machine relations is not restricted to robotics.

The work will:

- i) continue research to strengthen Europe's scientific and technical capital in this domain, by progressing advanced functionalities and cognitive capabilities of robotic systems and by extending this research to smart spaces and symbiotic human-machine interactions;
- ii) introduce a special emphasis on systems integration, through use cases which exploit and support the uptake by industries of promising technologies on an international scale.

Support actions will address road-mapping (PPP preparation) and investigate opportunities for pre-commercial procurement (PCP), to prepare the research community for a fully-fledged research - innovation approach in Horizon 2020.

Objective ICT-2013.2.1 Robotics, Cognitive Systems & Smart Spaces, Symbiotic Interaction

Target Outcomes

RTD targets systems that can operate autonomously in the real world through e.g. scene and context understanding, anticipation and reaction / adaptation to changes, manipulation and navigation, as well as symbiotic human-machine relations.

- RTD will help to achieve breakthroughs in the introduction of robotics technology in diverse physical environments and in smart spaces (with energy efficiency improvements). Complementary RTD strands in the Target Outcomes listed below may be combined as appropriate, including through

¹⁵ In line with the goals of the European Innovation Partnerships such as the Active and Healthy Ageing.

demonstration as well as methodological validation approaches and measures of progress (e.g. through suitable benchmarks).

- Foundational research will address cognitive systems and symbiotic human-machine interactions.

a) Intelligent robotics systems

RTD will address advanced robotics functionalities in e.g. manipulation / grasping, mobility and navigation, compliant actuation and locomotion, system-related challenges such as autonomy, adaptability, scalability and robustness in different types of environments, and interaction concerns such as safety, natural human-robot interaction and robot-robot cooperation. This will be achieved via new levels of capabilities in perception, understanding and action based on advanced sensori-motor systems. The robots will be of various shapes and sizes (from micro-robots to large size) and validated in real-life situations.

b) Cognitive systems and smart spaces

RTD will target advanced cognitive systems research, addressing key research bottlenecks and crucial cognitive capabilities which are missing today. Advances will be sought in sensing, perception, understanding, learning, reasoning and action (at appropriate levels of autonomy), including spatio-temporal cognition in real-world environments. This will need fundamental re-thinking of basic scientific methods and will build on emerging inter-disciplinary approaches.

RTD will also address smart spaces consisting of infrastructures (integrating sensors, actuators and processing), intelligent interfaces and robots which proactively support people in their everyday lives in domestic, professional and public environments. The emphasis will be on novel, intuitive, immersive interactions between the environment, objects in the environment, machines and users, individually or in groups.

c) Symbiotic human-machine interaction

Foundational research on symbiotic relations between humans and machines will aim at the design of new interactive technologies based on new theories and models of human cognition and emotion, non-rational decision-making, social behaviour and spatial and temporal perception and processing. RTD will also investigate the influence of such technologies on human behaviour and methods to promote positive co-evolution and co-adaptation of symbiotic systems.

Expected Impact

The overall impact expected is to contribute to an appropriate mix of the following:

- help increase Europe's market share in industrial and service robots to reach one third of market share by 2020, and improve the competitiveness of Europe in manufacturing sector.
- create a substantial upsurge in the involvement of key industry players, including SMEs and mid caps, in EU-level collaborative research, strengthening their links with academia.
- achieve scientific and technical excellence in terms of e.g. improved systems functionality, quality, performance and sustainability and degree of successful integration of such results into real-world scenarios.

- develop innovative concepts and prototypes of co-evolving technologies based on new theories and models and deeper understanding of human behaviour.
- achieve high levels of scientific publication as well as new PhDs and open source software releases or patents.

Funding Schemes

a), b), c): IP, STREP

Indicative budget distribution

IP/STREP: EUR 67 million, of which minimum 52M€ for target a) and b), and minimum 10M€ for target c). Within these constraints, a minimum of 40% of the objective budget to IPs and 25% of the objective budget to STREPS.

Call

FP7-ICT-2013-10

Objective ICT-2013.2.2 Robotics use cases & Accompanying measures

Target Outcomes

The main outcome is to stimulate innovation in robotics research at an EU level, thus accelerating the transition of scientific and technical research results into proof of concept, exploitable technology, prototypes and intellectual / industrial property. The primary focus on developing use-cases which target the emerging robotics service sector will be accompanied by strategic measures in road mapping, networking and outreach.

a) Use-cases in service robots

Projects will test and validate promising robotics applications, in terms of their potential take-up and operational deployment. Potential application areas will include societal challenges (e.g.: food production, maintenance and inspection, healthcare, security¹⁶) and professional services (e.g.: in agriculture & farming, logistics or cleaning), as well as new industry sectors which have not used robotics so far.

b) Robotics research roadmap coordination and socio-economic aspects

CSAs will develop strategic roadmaps with relevant stakeholders, building on current robotics research networks¹⁷ and supporting the EUROP technology platform in preparing a robotics PPP, as well as supporting academia-industry collaboration. European interests in the relevant standardisation forums will be promoted. Work will also explore the socio-economic drivers and impact of robotics RTD, including market observation, ethical and legal issues and will identify opportunities and prepare the ground for pre-commercial procurement (PcP), including e.g. in robotics

¹⁶ The activities related to security are complementary to the 'Security' Theme of the FP7 Cooperation Programme

¹⁷ E.g. EUROBOTICS, EURON. EUCognition will last beyond 2013 and well into 2014

for search & rescue, public services (e.g.: security¹⁸ and inspection, cleaning, assistance), or intelligent logistics.

c) Robotics networking

CSAs will: establish flexible mechanisms to exchange knowledge and skills via e.g. new educational courses, summer schools or study visits, especially for young post-docs, within and beyond the EU; help identify new users and markets and new research areas through sector-based analysis; establish a strategy towards sustainable international cooperation in robotics, focussing initially on the United States.

d) Dissemination and Outreach

CSAs will: increase the general level of public awareness of robotics through public relations and outreach about Challenge 2, including targeted showcases.

Expected Impact

Use case projects and accompanying measures are all geared towards opening potential new markets in the emerging service robot sector. The actions will aim to achieve:

- Higher use of robotics and stronger levels of participation by EU companies – including those not yet active in EU settings – in industry and user-driven RTD in this domain.
- Successful technology transfer in terms of volume and scale of innovative products and services in the professional service areas described in a) above
- Increased visibility of the programme to the European citizen via traditional and new social media channels.

Funding Schemes

a) STREP

b), c), d) CSA

Topics in b), c) and d) may be covered by one or several CSAs as appropriate.

Indicative budget distribution

- STREP: EUR 20 million
- CSA : EUR 3 million

Call:

- FP7-ICT-2013-10

¹⁸ The activities related to security are complementary to the 'Security' Theme of the FP7 Cooperation Programme

7.3 Challenge 3: Alternative Paths to Components and Systems

Challenge 3 covers nanoelectronics and photonics, the heterogeneous integration of these key enabling technologies with related components and systems, as well as advanced computing and control systems at a higher level. Energy-, resource- and cost efficiency as well as recycling/end of life issues are major drivers across the Challenge. Its overall aims are:

- to reinforce European industrial leadership in these key enabling technologies through miniaturisation, energy-efficiency, performance increase and manufacturability, for information and communication systems and other applications in 2020 and beyond;
- to enable further integration and cross-fertilisation of key enabling technologies towards building energy- and resource-efficient components and systems through the convergence of nanoelectronics, nano-materials, biochemistry, measurement technology and ICT;
- to expand Europe's industrial leadership in embedded and mobile computing systems towards powering the cloud with cost and energy efficient servers, and towards exploring new paradigms for control in systems with mixed criticalities where the embedded world meets the internet world, and systems of autonomous systems with emergent behaviour.
- to promote inter-disciplinary R&I activities by bringing together different research domains and constituencies with the aim of increasing impact and of bridging to Horizon 2020;
- to stimulate the innovation of European industry by well-targeted take-up actions, with special emphasis on SMEs – either as users or as technology suppliers.

In those areas related to the ENIAC¹⁹ and ARTEMIS²⁰ JTIs, Challenge 3 focuses on research on new paradigms which are applicable across several application domains. Related to Photonics and to the integration of components and systems, work is aligned with the strategic research agendas of Photonics21²¹ and EPoSS²².

Stimulating innovation through take-up

The objectives under this challenge include actions for technology take-up and innovation, which aim at creating an innovation ecosystem where industry is introduced to new technologies and markets. They focus on emerging innovative technologies and processes, which need to be validated and tailored for customer needs before being able to compete on the market. Special emphasis is on strengthening the participation of European SMEs, both on the supply-side and on the demand-side.

¹⁹ <http://www.eniac.eu>

²⁰ <http://www.artemis-ju.eu>

²¹ <http://www.photonics21.org>

²² <http://www.smart-systems-integration.org>

Two types of take-up activities are supported at **technology-domain level**, each of which brings together all relevant actors from the use and supply side supported by competence centres:

- a) **Assessment experiments** assess new or enhanced equipment, tools, processes, or methodologies, and their use. The objective is to support suppliers, in particular SMEs, in crossing the "valley of death" from research prototypes to successful market adoption (objective 3.3).
- b) **Access services** provide fast access to knowledge, training, prototyping, manufacturing, design or engineering services for first users and early adopters, in particular SMEs, through experiments. The objective is to reinforce the competitiveness of users by enabling them to exploit innovative technologies (objectives 3.2, 3.3, and 3.4).

For both types, activities are expected to be clustered in larger projects to achieve critical mass and to better exploit EU-added value. Common tasks include: targeted dissemination; management of calls for new actions; exploitation of synergies across actions. To better cope with the speed of innovation in ICT, implementation must be flexible and fast. Part of the actions and partnership are to be defined from the outset, while additional experiments or users, may be identified through open calls during the action (max. 50% of the total budget).

To facilitate the emergence of a European **innovation-ecosystem**, a network of innovation multipliers will be established across all take-up projects and disciplines to achieve broader coverage thereby maximising impact and better addressing the needs of SMEs. Tasks include establishing a single innovation portal allowing one-stop-shopping for newcomers; sharing of best practices and experiences; dissemination; and brokering between users and suppliers in light of open calls. The participation of actors traditionally not participating in research projects or programmes is encouraged, e.g. regional innovation clusters, chambers of commerce, societal actors, industrial associations, technology transfer departments of large research labs. This cross-objective action is included under Objective 3.3.

Objective ICT-2013.3.1 Nanoelectronics

This objective addresses overcoming serious barriers, which are currently slowing down the expected evolution of CMOS, including the fundamental limits of devices and materials, system level limits, energy-efficiency, power density issues, design complexity issues, and cost. It is in line with the ITRS roadmap. It complements FET, and the more application driven and closer to market activities carried out under the ENIAC JU. Take-up actions in nanoelectronics, including Europractice-type actions, are addressed under Objective 3.3.

Target Outcomes

- a) **Integration of advanced nanoelectronics devices and technologies (16nm and below)**
 - New solutions to boost performance in More Moore. This includes Ge, III-V compound semiconductors, graphene, CNT or nanowires.
 - Innovative solutions to boost functionality in More than Moore.

- New switches for Beyond CMOS and beyond silicon, charge-based or non-charge-based with a sufficient level of technological maturity.
- Interconnects and 3D integration at device, chip and wafer level.

b) Advanced nanoelectronics manufacturing processes.

- More Moore IC Manufacturing: efficiency and productivity enhancement
- Manufacturing approaches to Beyond-CMOS and advanced More-than-Moore, and to their integration with nano-CMOS including 3D integration.

c) Design, modelling and simulation for advanced nano-electronics technologies

- Circuit- and system-level modelling and simulation: e.g. quantum and atomic scale effects; electro-thermo- mechanical effects; modelling for new materials, processes and devices.
- Design technologies for "Si complexity" challenges addressing non-ideal scaling of device parasitics and supply/threshold voltages; manufacturing variability; thermal effects; decreased reliability; ageing effects; coupled high-frequency devices and interconnects.
- Innovating with nanoelectronics - designing heterogeneous SOC integration, re-using IP.

d) International Co-operation

One support action to develop a European strategy which addresses the challenges in manufacturing for 450 nm in dialogue with G450C and with the US, Korea, and Taiwan.

Expected impact:

- Secured European **industrial competence** in advanced nanoelectronic technologies, and strengthened European **capacity to manufacture** nanoelectronic products.
- **Improved performance at lower cost:** improvements boosting performance and functionality at all levels (device, circuit, system), and in particular in relation to a few critical parameters which drive integration and miniaturisation such as operating frequency, switching time, throughput, device or circuit complexity;
- **Higher energy efficiency:** reduction of device/circuit/system power consumption through improved energy per operation, efficiency of basic components, and control of leakage currents;
- **Higher levels of integration and miniaturisation:** improvement in component/functions per chip, cost per function, compactness, design productivity exploring new materials, architectures, and design - going beyond just an extension of known practices;
- **Improved structuring:** improvement in coordination of European research priorities and their industrial relevance, exploitation perspectives for Europe in terms of competitiveness and, jobs.

Funding schemes

a) – c): STREP

d): CSA

Indicative budget distribution

EUR 31.5 million for STREPs

EUR 0.5 million for one SA

Call: FP7-ICT-2013-11

Objective ICT-2013.3.2 Photonics

The aim is to advance the state-of-the-art of photonic devices (i.e. components and sub-systems such as transmitters and receivers, lasers and light sources) in application fields where Europe is strong²³ and to develop advanced products with a view to industrialisation. Research actions should demonstrate strong industrial commitment and be driven by user requirements. They should include validation of results for the target applications and address the supply chain as appropriate.

Target Outcomes

a) Application-specific photonic devices

Focus is on new device technologies and architectures, including as appropriate the related materials, processing and device integration issues. Research actions should address:

i) Optical data communications²⁴: Photonic devices enabling future networks with increased flexibility, bandwidth, energy efficiency and cost effectiveness. Specific emphasis is on devices for fully converged optical networks allowing several bitrates, modulation formats and/or radio standards on the same infrastructure; and on devices for flexible, dynamic optical networks coping with varying traffic demands, possibly including quality of service management at the optical layer. Device manufacturers, suppliers of communication equipment and network operators should be involved.

ii) Solid-State Lighting (SSL):

- Large-area, large uniformity OLEDs for general lighting applications with increased lifetime and brightness enabling an effective market introduction.
- High performance, reliable and low-cost SSL lamps and modules with added intelligence to provide optimal lighting systems.

Research actions should also address end-of-life/disposal/recyclability issues and involve SSL manufacturers and/or suppliers.

iii) Lasers for industrial processing: Short and ultra-short (below 10 ps) pulsed laser sources with average output power above 200 W, high conversion efficiency and repetition rate for high speed surface processing or cutting at micro/nanometre precision. Activities may include the necessary optical elements for beam

²³ Due to synergies, biophotonics is addressed together with micro-nano-bio systems under objective 3.3

²⁴ Photonic devices for communication networks support the overall vision and requirements of Objective 1.1 "Future networks"

delivery, guiding and shaping. Laser device and equipment manufacturers and end users should be involved.

b) Cross-cutting technologies for a wide range of applications

Focus is on technologies for automated, low-cost volume manufacturing of highly integrated, complex photonic devices:

- i) Integration technologies for photonic integrated circuits offering enhanced capabilities (e.g. integration density, functionality, performance) through the use of innovative materials, nanophotonics or other new functional structures. This may include also heterogeneous integration based on wafer processing technologies. Photonic device manufacturers should be involved.
- ii) Cost-effective assembly (including in particular hybrid optical integration) and packaging technology. Actions should also address the related thermal, electrical and mechanical challenges and fabrication technology. Photonic device manufacturers and fabrication tool suppliers should be involved.

c) Technology take-up and Innovation Support

- i) Access services enabling the wider adoption and deployment of photonic technologies in innovative products, in particular by SMEs and driven by their business needs²⁵. Proposers are referred to the description of take-up actions in the introduction to this Challenge.
- ii) Coordination and support actions fostering innovation in SSL²⁶:
 - a) Bringing together actors along the value chain to promote innovative design and new business models through open innovation.
 - b) Promoting the cooperation of lighting industry and end users (e.g. architects, designers, installers) to accelerate the wide deployment of SSL.
 - c) Promoting SSL and analysing its effects in applications where there are benefits for people's health and well-being.
 - d) Addressing scarcity of materials, use of hazardous materials and recyclability & disposability of SSL products.
- iii) Coordination and support actions:
 - a) Cooperation of photonic clusters and national technology platforms to stimulate the innovation potential of SMEs, based on business cases demonstrating a clear potential for sales and employment growth.
 - b) Raising the interest of European citizens, young people and entrepreneurs in photonics. Actions should be driven by the relevant stakeholders.

d) ERANET-plus action

A joint call for proposals on a photonics topic of strategic interest, to be funded through an ERANET-Plus action between national and regional grant programmes.

Expected Impact

- Secured European **industrial leadership** in photonic applications and technologies, and safeguarded European capacity to manufacture innovative products.
- Broader and faster **take-up** of photonics in innovative products, in particular by SMEs.

²⁵ This action should cooperate with others in key enabling technologies in Challenge 3 – see Objective 3.3 b) ii)

²⁶ These actions are in line with the Green Paper "Lighting the Future", COM(2011) 889 final.

- Accelerated innovation and deployment of SSL;
- Improved **innovation** effectiveness of photonics clusters in particular towards SMEs;
- Increased **awareness and interest** in photonics amongst the general public, youngsters and entrepreneurs.
- Closer cooperation and greater alignment between the participating regional, national and EU-wide research programmes through an ERANET+ action.

Funding schemes

a), b): STREP; c) (i) IP; c) (ii),(iii) CSA; d) ERANET-Plus

Indicative budget distribution

IP and STREP: EUR 50 million, maximum EUR 8 million for IP.

CSA: EUR 7 million

ERANET-Plus: EUR 4 million (any remaining funds will be transferred to target outcomes a) and b)).

Call:

FP7-ICT-2013-11

Objective ICT-2013.3.3 Heterogeneous Integration and take-up of Key Enabling Technologies for Components and Systems

Building energy and resource efficient systems for competitive, highly performing products, applications and services requires further integration of key enabling technologies, components and subsystems. It also needs a functioning ecosystem of actors, in which the research, design, and take-up of innovative technologies is stimulated. Strong industrial participation along the value chain is a must as well as focusing not only on research but also on deployment driven by concrete business cases. End-of-life/disposal and recyclability issues should be addressed as appropriate.

Target outcomes

a) Integrating heterogeneous technologies

This target outcome addresses the integration of Key Enabling Technologies for Components and Systems across multiple research fields (nano-systems, organic electronics, micro-nano-bio systems, bio-photonics), materials (organic and inorganic) and functions (sensing, actuating, communicating, processing, energy harvesting) with emphasis given to supporting the semiconductor heterogeneous integration (hardware, software, photonics, MEMs). The major challenges include mastering interactions and underlying complexity; design, prototyping, manufacturability and recyclability; biocompatibility, safety, security, reliability, miniaturisation; low energy use and resource-efficiency. Focus is on:

- Miniaturised smart systems** based on the integration of different key enabling technologies and functions, which have the ability to sense, describe, predict, decide, and to interact with their environment. Being standalone, networked, or embedded into larger systems, smart distributed environments

or smart spaces; they use highly sophisticated interfaces between systems and users and can address and identify each other.

- ii) **Hybrid integration of organic electronics and micro/nano electronics** on flexible, large area and/or stretchable substrates, combining different materials, components and subsystems, creating opportunities for application driven integrated systems. Focus is on interfacing different types of material, different types of components and subsystems, different design styles or production processes and dealing with process variations, multi-layers, packaging and encapsulation.
- iii) **Further development and validation in real settings of micro-nano-bio and bio-photonics systems** addressing key societal challenges, in particular in the health (for early or fast diagnosis and monitoring or surgery) and the food sectors (quality and safety), with involvement of relevant industrial stakeholders and driven by users.

b) **Technology take-up and innovation support**

Technology take-up is stimulated by a set of supply- and demand-side measures, supported by a network of innovation multipliers. Proposers are referred to the general description of take-up actions in the introduction to this Challenge.

- (i) **Assessment experiments in nano-electronics and smart systems** for technology suppliers and integrators to evaluate their novel equipment, processes and building blocks with potential customers.
- (ii) **Access services** for new users of nano-electronics design and smart systems spanning the full innovation cycle and ranging from consultation, assistance in conception and design, access to tools and equipment, and training; to feasibility studies, prototyping, pilot runs, and advanced flexible manufacturing – including Europractice-type actions.
- (iii) A **network of innovation multipliers** established across all take-up projects of this Challenge taking an interdisciplinary approach to achieve broader technological, applications, innovation, and regional coverage thereby maximising impact and better addressing the needs of SMEs.
- (iv) Supporting the development of an **eco-system for smart systems integration** in Europe, including activities such as co-ordinating regional clusters; developing training material and services; international cooperation related to road-mapping, manufacturing and standardisation; and reaching out to attract the interest of citizens, young talents and young entrepreneurs.
- (v) Cooperation of scientists, technology developers and providers, and end users for accelerating the deployment of bio-photonics and micro-nano-bio solutions.
- (vi) **International co-operation** with Africa on roadmapping and constituency building towards the development and deployment of point-of-care diagnosis and treatment of human and animal diseases in rural areas.

Expected impact

- Increased **industrial competitiveness**, in particular of SMEs, through strengthened capabilities in systems and innovative products and services.
- **Improved system characteristics**: higher performance and functionality; physical features; economics/cost; environmental, in the context of the final application.
- More **autonomous** smart systems which are aware of and adaptive to their environment, ubiquitously connected, with cognitive abilities.
- Improvements in **innovation capacity and competitiveness** of European industry measured through indicators such as an increased number of SMEs and other newcomers taking up novel technologies.

Funding schemes

- a): IP and STREP;
- b) (i), (ii): IP;
- b) (iii), (iv), (v), (vi): CSA.

Indicative budget distribution

- IP and STREP: EUR 61 million with a minimum of 25% to IPs and 25% to STREP. It is expected that a minimum of one IP each for a)(i), a)(ii), b)(i), and b)(ii) is supported;
- CSA: EUR 3 million.

Call:

FP7-ICT-2013-10

Objective ICT-2013.3.4 Advanced computing, embedded and control systems

Driven by use cases addressing the grand societal challenges in Europe, the objective is to combine and expand Europe's industrial strengths in embedded and mobile computing and in control of networked embedded systems along two dimensions: (1) designing the next generation of cost- and energy-efficient computing systems to power the future "cloud", and (2) expanding the functionality of embedded systems architectures towards controlling their behaviour within a system of systems (SoS) and towards seamlessly integrating safety- and time-critical with non-critical functionalities sharing common computing resources and evolving from the convergence of the embedded and the internet worlds.

Addressing novel paradigms applicable across different applications, work is complementary to what is addressed under the Joint Undertaking ARTEMIS. While computing is addressed under several challenges, work in this objective focuses on computing systems for embedded systems and for data centres, and generic technologies and tools applicable across computing segments. Thereby it is complementary to the work under Objective 1.2 related to computing architectures for future cloud services, and Objective 9.10 related to exa-scale computing, and Objective 6.2 focusing on energy and environmental performance of data centres.

Target outcomes:

- a) **Next generation of energy- and cost-efficient servers for data-centres**

System design addressing the full server eco-system: processor, chip, board, rack, storage, network, data-centre, system software, applications. Research challenges include: taming the data deluge; holistic integration of hardware and software in future servers including 3D-stacked server chips or optical interconnects; operation and load-balancing over a collection of physically distributed sites. Being highly ambitious with strong industrial participation and a clear path to commercialisation, projects should deliver a full prototype and validate it under real-life workloads from various application areas including clouds.

b) Control in embedded systems with mixed criticalities sharing computing resources

Innovative solutions capable to manage design, modelling, verification, validation and certification of networked complex systems featuring an extended functionality through seamless integration of mixed criticalities. Focus is on data, energy and system integrity in addition to security, safety and performance when exploiting multi-core chips or heterogeneous distributed systems. An integrated approach is expected on the one hand addressing fundamentally new perspectives of control and computing and on the other hand building on existing or emerging approaches for standardisation and certification. Work should encompass prototyping and validation of the developed methods and architectures in minimum two application domains.

c) Exploiting synergies and strengths between computing segments

Bringing together teams from embedded computing and high-performance computing to jointly address challenges that are common in these two areas and are magnified by the ubiquity of many-cores and heterogeneity across the whole computing spectrum. Examples of challenges include: low-power and energy efficiency, performance analysis, dependability, time-criticality, hybrid programming, parallelisation, compilation, debugging, co-design, customisation, virtualisation, reconfigurability. Projects should focus on one specific and credible common challenge and prove a real cross-fertilisation of expertise.

d) From analysing to controlling behaviour of Systems of Systems (SoS)

Analysing and modelling SoS with possibly emergent behaviour and their control, and validating new SoS engineering approaches in industry-driven case studies of real applications, such as distributed energy systems and grids, multi-site industrial production, or automated transportation. Generic aspects of the approaches should be stressed, basic concepts elaborated and open research issues identified.

e) Access to novel computing technologies for industry

Access services for technology transfer from academia to industry in computing including activities to strengthen links to venture capital and promoting entrepreneurship. The aim is to facilitate the transformation of research prototypes to products and services and to introduce lead customers to technologies and tools for multi-core and hybrid systems across the computing spectrum. Proposers are referred to the general description of take-up actions in the introduction to this Challenge.

f) Constituency building and road-mapping

Co-ordinating SoS-related projects towards deriving common concepts and research challenges and building constituencies for a European R&I agenda on SoS. Building constituency and developing a R&I agenda towards radical improvements in software development for advanced computing systems.

Expected Impacts

- Reinforced **competitiveness** of European technology suppliers across the computing spectrum; in particular for data-centre servers with two orders of magnitude improvements in total cost of ownership and energy efficiency.
- Reinforced European **technological leadership and industrial competitiveness** in the design, operations, and control of embedded systems with mixed criticalities and SoS.
- **Improved systems characteristics:** energy/cost efficiency, controlling dynamic and emergent behaviour, managing different criticality levels, security, safety, degree of integration in generic architectures and platforms.
- Increased **take-up** of European computing technologies in industry, in particular SMEs.
- More **efficient application software development** by breaking the dependence on dual expertise for application development and customisation for advanced computing systems.

Funding schemes:

- a), b): IP – it is expected that a minimum of one IP is supported for each target outcome.
- c), d): STREP
- e), f): CSA

Indicative budget distribution

- IPs and STREPs: EUR 69 million with a minimum of 40% to IPs and 30% to STREPs
- CSAs: EUR 3.5 million

Calls:

FP7-ICT-2013-10

7.4 Challenge 4: Technologies for Digital Content and Languages

Digital content remains the material basis for a multilingual knowledge based society. However the explosive growth of digital content (both structured and unstructured) makes it important for European citizens and organisations to learn to manage it effectively and to extract from it maximum value in terms of private or public, personal or organisational decision making, planning and management.

The focus of Challenge 4 is on:

- exploring and testing new approaches, methods and techniques to extract, interpret and exploit information from unstructured multilingual and/or multimedia sources, yielding actionable knowledge;
- developing and testing in realistic operating conditions new algorithms and software frameworks to analyse, interact and visualize extremely large volumes of data in real time;
- supporting Small and Medium Enterprises (SMEs) developing innovative applications in structured and unstructured digital content management and, particularly, in the reuse of open data.

Support actions for road-mapping are also envisaged to prepare the constituencies for bringing together research and innovation aspects in Horizon 2020.

Objective ICT-2013.4.1 Content analytics and language technologies

Target Outcomes

Due to the combined effect of globalisation and European integration, there is a growing need for effective solutions that support multilingual business and interpersonal communication, and enable people accessing digital services in Europe's many languages.

a) Cross-media content analytics

Innovative methods and tools for mining unstructured information embedded in text, speech, audio and video for the purposes of context-aware interpretation, correlation, aggregation and summarisation, turning information into usable understanding and actionable knowledge. Special emphasis is placed on social and collective intelligence from multilingual sources. Projects shall achieve broad coverage with efficient semantic interpretation. Of specific interest is the ability to capture sentiment and represent concepts and events, identify relations and similarities, interpreting time and space, within and across individual media, thus increasing our ability to detect and exploit otherwise hidden meaning across a range of applications.

b) High-quality machine translation

Advancing machine translation (MT) by pushing the research frontier and bridging relevant disciplines. Emphasis is placed on high-performance and easily configurable MT yielding high-quality translations suitable for publication with little or no human intervention. Expected innovations include effective hybridization of existing and emerging solutions, the ability to autonomously learn from use and human feedback, and to adapt to new situations with high portability and scalability. Work should cope with everyday language and with the need to compile translation resources

dynamically from the web or enterprise repositories. Projects are expected to demonstrate the successful integration of MT within larger systems.

c) Natural spoken and multimodal interaction

Speech-enabled interfaces based upon multimodal verbal and non-verbal communication. Projects shall address autonomous human-like social agents that can handle conversational speech; learn from interaction and react proactively to new communicative situations; recognize and generate social cues. Systems should be able to cope with spontaneous dialogue and exhibit adequate communicative, affective and cognitive (e.g. question answering) capabilities in relation to the domain/task under consideration and the needs and abilities of the user. Technologies should be designed to match multiple delivery platforms, from virtual assistants e.g. for customer service, through smartphones to games.

For each of the target outcomes (a), (b) and (c), the call invites

(i) a few ambitious R&D projects investigating new approaches and research avenues well beyond the current state of the art; projects will be centred on cross-disciplinary approaches and partnerships, and address multimedia content and multimodal interaction; they will encompass everyday language as found in e.g. consumer-generated content, cover multiple languages, and cater for written and/or spoken language as appropriate; technologies shall be adaptive, cope with massive volumes of content, and have a clear potential to support real-life processes;

(ii) one broad-based support action designed to establish a unifying roadmap in each of the domains under consideration, developing a compelling research and innovation agenda until and beyond 2020, centred on close collaboration between research centres and commercial players (particularly SMEs), and based upon agreed reference architectures, common resources (standards, software, data), and shared development and evaluation facilities.

d) Developing joint plans and services

The call invites one support action intended to design and lay the foundations of a scalable platform for the joint development/enhancement and hosting of (multi-) language data sets, processing tools and basic services. The action will build upon and extend existing and emerging collaborative infrastructures. The aim is to create over time a comprehensive online repository of reusable modules and components, in the broadest possible range of EU languages, underpinning research, technology transfer and industrial development efforts.

Expected Impact

- Strong participation of private-sector players, including SMEs, well above the FP7 ICT average.
- A unifying research roadmap aggregating the vision of more than 200 centres; a common innovation agenda based on the business strategy of more than 100 companies.
- Technological leadership and increased innovation capacity as a result of widely accepted roadmaps encompassing presently fragmented communities.
- A European open-source MT system becomes the most widely adopted worldwide; post-edited MT becomes the standard mode of translation within 5 years, increasing significantly (> 25%) the efficiency of human translation.

Funding Schemes

a), b), c): STREP, CSA

d): CSA

Indicative budget distribution

- STREP: EUR 21 million
- CSA: EUR 6 million

Call:

FP7-ICT-2013-10

Objective ICT-2013.4.2 Scalable data analytics

Target Outcomes

Tools and skills to deploy and manage robust and high performance data analytics processes over extremely large amounts of data. User-driven research with ideally public and methodologically sound quantitative performance evaluation criteria is a strict requirement. As a bridge to activities to be pursued under the Horizon 2020 program, two distinct types inter-disciplinary road-mapping activities can be supported: a roadmap for networking and hardware optimisation in support of next generation Big Data management solutions and a second roadmap for the social, legal, economic study of externalities in the (re)use and linking of data.

a) Scalable algorithms, software frameworks, visualization

- Novel algorithms, software infrastructures and methodologies for real time interaction, visualization, analytics and decision support applications over extremely large volumes of data (both structured and unstructured).
- Data types that are currently experiencing very high growth rates are of special interest including (but not limited to) 3D, biology, genomics, financial, geospatial, social networks, transportation, logistics, telecommunications, engineering, digital content industries and any type of data stream.
- Non-traditional database and storage solutions and data integrity protection tools are solicited for the robust integration and interpretation of heterogeneous data sources such as static and streaming data.

The availability of extremely large and realistically complex data sets and/or streams is a strict requirement for participation as is the availability of appropriate populations of experimental subjects for human factors testing in the domain of usability and effectiveness. Software implementations must be rigorously tested in the environment of professional organisations with a clear stake in the solution and a clear path to deploying it, if effective.

b) Big Data networking and hardware optimisations roadmap

- One inter-disciplinary CSA to bring hardware and networking experts together with designers of algorithms and software frameworks and Big Data practitioners. This will define a shared European vision for future Horizon 2020 R&D activities

on the design of dedicated processing or networking hardware for optimising the performance of Big Data analytics, including programming frameworks that software developers without specialised hardware knowledge could use easily.

The roadmap will chart advances in scalability and run-time performance as well as energy efficiency and sound methods for analysing and optimising capital versus operating costs of Big Data operations. The CSA will also be responsible for disseminating the roadmap across relevant constituencies and establishing cross-disciplinary communities with a shared understanding of concrete problems worth investigating in future programmes.

c) Societal externalities of Big Data roadmap

- One CSA to produce a roadmap for future activities on the sharing and reuse of large and linked datasets including those obtained by data harvesting across heterogeneous data sources. The CSA should bring together social science scholars, open data activists, statisticians, computer scientists and other relevant parties in order to design a European data environment capable of amplifying positive externalities and reducing negative externalities.
- Positive externalities to be addressed include (but are not limited to) economic and legal models for efficient data markets.
- Negative externalities include (but are not limited to) the privacy risks that come from the re-identification of personal information, particularly as a consequence of more and more data sets becoming available and being linked to one another. Ethical and moral considerations should also be taken into account.
- The CSA will also be responsible for disseminating the content of the roadmap across the relevant constituencies and establishing cross-disciplinary communities with a shared understanding of concrete problems worth investigating in future programmes.

Expected Impact

- Advanced querying and analytics applications with sub-second response times over distributed information resources consisting of trillions of records.
- Ability to query or detect in real time complex events against dynamic feeds of millions of data streams generating hundreds of thousands of events per seconds.
- Visualization systems enabling exploratory analysis and manipulation without any perceptible delay on data resources containing billions of items.
- Enabling European suppliers to reach by 2020 a share of the Big Data market compatible with the size of our economy (30% of world market).

Funding Schemes

a): IP, STREP

b), c): CSA

Indicative budget distribution

- IP/STREP: EUR 26 million

- CSA: EUR 5 million

Call:

FP7-ICT-2013-11

Objective ICT-2013.4.3 SME initiative on analytics

Target Outcomes

Helping European Small and Medium Enterprises acquire the competences and resources they need to develop innovative content and data analytics services. Development of services based on the use of available data, particularly from public bodies, is specifically required for theme a) and encouraged for theme c).

a) Integrated Open Data Incubator

An Integrated Project to establish an environment and calling for efficient, small scale development of services of commercial interest based on the use of European open data by Small and Medium Enterprises (SMEs). The IP should:

- devote most of its resources to publish and manage regularly scheduled and well advertised calls for SMEs to submit mini-proposals to be funded for a period between six and twelve months.
- create a computing infrastructure where the winning mini-proposals will find accurate, up-to-date and (when useful and feasible) linked versions of the data they need for their services and, if they so wish, deploy the experimental version of their services.
- establish a mechanism for connecting open data demand and supply by systematically contacting European public bodies for their open data and assisting them in the efficient and sustainable publication of such data, if needed with targeted engagements.
- solicit open data reuse ideas from the general public and conduct a European wide open data reuse information campaign.
- The IP will finally create a process to connect the most successful SMEs with sources of funding and business networks.

b) Easing transfer and take-up of language technologies

Language technologies are often deployed within products and services relating to web or enterprise intelligence, including text and audio mining, social media analytics and sentiment analysis, enterprise search and content management, online and cloud based translation, etc.

This action calls for focused user- and market-oriented projects in any of the above areas, with the overall goal of bringing language technologies closer to commercial maturity through an "industrialisation" process including but not limited to: (i) engineering of promising but commercially untested technologies, e.g. in terms of performance, robustness and coverage; (ii) integration within existing or upcoming products and services; (iii) first-use experimentation and validation in a clearly identified application domain; (iv) in-depth assessment along technical, user related

and economic dimensions; (v) identification of possible exploitation paths and viable business models, and of suitable sources of funding.

Consortia shall include players from the demand and supply sides, in particular SMEs, who have a clear interest in the exploitation of results.

c) Software components and intuitive end user applications based on reuse of open data

Development of software components supporting the whole life cycle of reuse of multilingual open data, particularly from public bodies. This includes:

- usable data publications methodologies and tools, adapted to the operating conditions of typical public bodies and rigorously tested for traceability, usability and sustainability in a public body environment;
- methods and tools for linking open data sets produced by public bodies;
- methods and tools for optimising open data applications based on public demand both in terms of content and in terms of functionalities/usability;
- cross platform development tools for delivering intuitive and responsive open data applications on multimodal devices and environments such as mobile, tablets as well as desktop.

Expected Impact

- A European open-source MT system becomes the most widely adopted worldwide; post-edited MT becomes the standard mode of translation within 5 years, increasing significantly (> 25%) the efficiency of human translation.
- Dozens of data application software components, used by hundreds of developers.
- Hundreds of applications, reusing billions of open data records, used by millions of end users around the EU
- Wider creation of valuable applications by integrating available public data with the users' own data, including contextual information available from mobile devices.

Funding Schemes

a): IP

b), c): STREP

Indicative budget distribution

- IP: EUR 5 million,
- STREP: EUR 15 million

Call:

FP7-ICT-2013-SME-DCA

7.5 Challenge 5: ICT for Health, Ageing Well, Inclusion and Governance

Challenge 5 builds on the previous research activities on health, ageing, inclusion, and governance. Nevertheless, it adapts to support new policy developments such as the Digital Agenda for Europe, the European Innovation Partnership on Active and Healthy Ageing and Horizon 2020. It adapts also to better support innovation and activities closer to the market like pre-commercial procurement actions and platforms supporting social innovation.

The focus will be on development of solutions that empower the individual, in a social context, to improve and manage personal life as a citizen, elderly, patient, consumer, civil servant or worker. Special emphasis will be given to productivity gains, customer satisfaction, and provision of new capabilities of public interest, in particular harnessing the "network effect" typical of ICT networks.

The "ICT for Health activities" will address the "health management" continuum from lifestyle to disease management, including disease prevention and management of co-morbidities. This will be complemented by the research in the computational modelling of human physiology paving the way for the next generation of healthcare services to enable patient empowerment and safer, more personalised care.

The "ICT for Ageing and Independent Living" activities will focus on empowering people with age related dependencies or disabilities to live independently, delay/avoid institutionalisation and staying active as much and as long as possible. Solutions may combine health, social care and smart living systems and 'age-friendly' environments. This will be implemented jointly with ICT for Health activities in direct support of activities defined under the EIP Active and Healthy Ageing. Social and service robotics and early prediction will not be reopened in this call.

"ICT for smart and personalised inclusion", will focus on the development of accessible solutions for personalised interfaces to smart environments and innovative services for all users including those at risk of exclusion (disability, low digital literacy/e-skills). These activities will be complemented by coordination activities on road-mapping on advanced human interactions for accessibility, market strategy for eInclusion services and harmonisation of accessibility strategies.

Research in "ICT for Governance and Policy Modelling" will address collaborative governance supported by ICT tools empowering citizen and increasing transparency in decision making. In particular, research will address the social and economic exclusion of the younger generation, policy modelling for productivity gains and innovation in public service provision and for identifying emerging societal trends.

Finally, a new activity will support collaborative, collective awareness ICT platforms for grassroots social innovation towards a more sustainable future. The scheme will support application specific platforms enabling experiments and prototypes of decentralised grassroots social innovation for collective actions and improvement of societal aspects of human activities as well as related scientific and coordination issues.

Objective ICT-2013.5.1 Personalised health, active ageing, and independent living

This activity is a continuation of the three previous Objectives on "Personal Health Systems", "Patient Guidance Services" and "ICT for Ageing and wellbeing" in the ICT WP 2011-12. It bridges to Horizon 2020 and supports directly the European Innovation Partnership on Active and Healthy Ageing.

Target Outcomes

- (a) **Personalised Guidance Services for lifestyle management and disease prevention.** The aim is the development of personalised services, which enable individuals, from the younger to the elder population, to become **co-producers** of their health and maintain good health status. This will include: (i) a "virtual individual" model, which comprises the personal characteristics of an individual (e.g. personal profile, preconditions, risk factors, unhealthy behaviours, preferences, physical activity, sleep, mental status etc.); (ii) advanced sensors to acquire data on lifestyle aspects, behaviour and surrounding environment; (iii) intelligent systems for recognition of behavioural trends and prediction or early detection of health risks on the basis of heterogeneous data, including data acquired by sensors and individual self assessment; (iv) a supportive environment to engineer awareness about healthy behaviours, offer personalised guidance and provide support to behavioural change; (v) development of a new ecosystem of stakeholders, engaging also actors such as fitness, food and lighting industry, schools, health insurance companies, policy makers and media; (vi) innovation in organisational models and business models for ICT-enabled disease prevention.
- (b) **Personalised Guidance Services for management of co-morbidities and integrated care.** The aim is the development and small-scale validation of personalised services and care programmes, which engage patients as well as their relatives, as active members of the care team, enhance collaboration among carers and promote seamless continuity of care across different care settings. The focus is on patients who suffer from multiple chronic conditions and can benefit from integrated care approaches (i.e. integration between primary, secondary, home and self care). Solutions will encompass: (i) wearable, portable, mobile or web-based systems for monitoring of patient status and activity, therapy compliance or treatment at the point of need; (ii) auto-adaptive and self-calibrating systems that take into account the acquisition of physiological data in non-clinically controlled environments and the variability in the population, to help select and continuously adapt appropriate services to patients; (iii) decision support systems for professionals and patients, as well as patient guidance services, which build on multimodal data fusion (involving e.g. physiological, environmental, emotional and genetic data), data and pattern analysis, and modelling and predictive algorithms of patient health status; (iv) stratification of patients to care programmes and personalisation of such programmes to specific characteristics of patients; (v) innovation in care pathways, organisational models and business models.
- (c) **Personalised Services for Independent Living and Active Ageing,** for empowering people with age related dependencies to live independently for longer. The target is to develop novel prototypes of systemic solutions compensating for prevailing age-related physical and cognitive impairments leading to a significant prolongation of functional capacity, delay in institutionalisation, increased autonomy and participation in society. Proposals will identify and justify selection of key services with high impact such as

activities of daily living, safety, mobility, social inclusion with seamless support in and outside the home, and will build on progress in enabling ICT combined with behavioural and social science. The work should target elderly users and their carers and go clearly beyond state of the art in terms of increasing system efficiency (e.g. easy personalisation and adaptation to specific needs and preferences, with efficient data and context sharing between different required services and artefacts), improving reliability (e.g. handling multi-user identification, auto configuration and calibration systems) and easy end-user acceptance (e.g. by personalised high usability user interactions and unobtrusive sensing).

Each project aiming at target outcomes a), b) or c), shall focus on only one of these target outcomes. However, all projects in target outcomes a), b) and c) shall meet the following requirements: projects will address high risk and multi-disciplinary research, integrating and developing further, where necessary, safe hardware or software technologies; projects shall ensure sufficient user participation, realistic implementation environments and involvement of representatives of care authorities, to support the validation of the developed solutions and adapted organisational models.

Validation will aim to demonstrate, with quantitative indicators, the proof of concept, quality of life and care efficiency gains and, if possible, cost effectiveness of the proposed solution. Appropriate privacy and ethical safeguards should be included. The use and further development of existing open platforms and open architectures is required, to facilitate multiple types of services on interoperable infrastructure. Projects will also address technical and semantic interoperability issues concerning devices and heterogeneous sources of personal data related to health and wellbeing.

(d) Pre-commercial Procurement Actions (PCP). d1) Development of personalised care programmes for effective management of co-morbid patients, implemented with the use of ICT. d2) Development of mobile eHealth services to empower patients and enable patient-centric care, using mobile devices and converging software platforms. Examples include support to chronic disease management, medication intake, mental care, etc. The solutions will include patient-specific medical information, decision support systems and medical device functions. Aspects related to ethics, privacy, safety, risk management and regulatory developments of medical device software shall be conceptualised.

The solutions developed in d1) and d2 shall also explore new approaches in health service redesign, including care pathways, organisational models and business models. Use of open standards and open platforms is encouraged. PCP shall be implemented according to the conditions outlined in Objective 11.1 and Appendix 6.

(e) Coordination and Support Actions. e1) Community building on procurement approaches. To develop a stakeholder ecosystem and a core communications platform interconnecting in particular public procurers from Member States and Associated countries responsible for defining the acquisition strategies for innovative ICT solutions in eHealth, Active Ageing and Independent Living. Focus on sharing and disseminating evidence on procurement practices from European projects, in particular promotion of the risk benefit sharing aspects of and identifying opportunities for the pre-commercial procurement instrument and forward looking procurement strategies.

e2) Communications activities: To network all the eHealth, Active Ageing and Independent Living projects in FP7 and CIP, in order to co-ordinate their communication actions, exploit synergies with existing information services and achieve greater visibility to the general public. e3) IT skills for healthcare workforce in the EU and USA: To promote the development of renewed educational material and programmes in the EU and USA, with the aim of improving the IT skills of healthcare workers and facilitating the implementation of eHealth systems in practice. e4) Interoperability of patient summary between EU and US: To compare specifications of EU and US patient summaries with the aim of developing and testing common and consistent specifications and systems allowing the interoperability of electronic health records across the Atlantic. e5) Interoperability: To explore new ideas to accelerate or improve the international standardisation in the domain of eHealth and to propose a realistic roadmap to implement the recommended measures, taking into account the importance to have a convergent EU-US approach. Consideration to be given, among others, to ways to ensure convergence of health data structure models into one single international standard, and the possibility to establish a “universal exchange language” that allows data to be shared and communicated among diverse EHRs and other applications.

Expected Impact

Each proposal will present quantitative indicators or measures of success, to quantify potential impact along the points listed below for the target outcome concerned.

For target outcome a) only:

- Strengthened evidence of the impact of healthy behaviours on health and well-being.
- Strengthened evidence on the impact of disease prevention on health and expenditure.
- Contribution to a more sustainable European healthcare system through reduction of avoidable disease burden.
- Validated programmes and good practices for health promotion and disease prevention.
- Business ecosystem and new business models for promotion and co-production of health.

For target outcome b) only:

- Improved interaction between patients, their relatives and carers, facilitating more active participation of patients and relatives in care processes.
- Improved cooperation between the providers of health, social and informal care.
- Strengthened evidence base on health outcomes, quality of life, care efficiency gains and economic benefits from the use of ICT in new care models.
- Reinforced medical knowledge with respect to efficient management of co-morbidities.
- Increased confidence in decision support systems for disease/patient management.

- Involvement of care authorities in development of personalised care solutions, with increased commitment in the deployment of innovative services after the R&D phase.
- Increased level of education and acceptance by patients and care givers of ICT solutions for personalised care.

For target outcomes b) and c):

- Reduced admissions and days spent in care institutions, improved disease management and treatment at the point of need, actual improvements in the daily activities of older persons through the effective use of ICT and the better coordination of care processes.
- Increased degree of interoperability and standardisation in the developed solutions, with secure, seamless communication of data related to health and wellbeing among all involved parties, including patients, older persons and carers.
- Strengthened European industrial position in eHealth and independent living products and services by creating new business areas and relevant standardisation efforts.

For target outcome c) only:

- Increased personal independence, prolonging active participation in society and integrated care processes for the ageing population.
- Reinforced European academic and industrial knowledge base and excellence in multi-disciplinary research on ICT for Independent Living and Active Ageing.

For target outcome d) only:

- Improved patient safety and services for patients and health professionals, developed and validated against public sector needs for management of co-morbidities.
- Improved patient safety and chronic disease management, through advanced mobile medical applications that process patient-specific information for medical decisions.

For target outcome e) only:

- Enhanced awareness and enlarged stakeholder community on innovative procurement.
- Enhanced visibility and awareness of the results of EU projects in eHealth, Active Ageing and Independent Living.
- New educational material and programmes for IT-skilled workforce in healthcare.
- Improved international interoperability of eHealth Systems in the US and in Europe.
- Accelerated establishment of interoperability standards in eHealth and of secure, seamless communication of health related data.

Funding Schemes

a-c): IP/STREP; d): CP-CSA; e): CSA

Indicative budget distribution

- IP/STREP: EUR 48.3 million, with the objective to support at least one IP in a), at least one IP in b) and at least one IP in c)
- CP-CSA: EUR 8 million, with the objective to support up to one CP-CSA for d1) and up to two for d2) (maximum 30% of the CP-CSA budget for the CSA part)
- CSA: EUR 1.7 million. For each topic, up to one CSA will be selected with maximum duration of 24 months and maximum EC funding of EUR 500.000 for e1), EUR 400.000 for e2), EUR 200.000 for e3), EUR 200.000 for e4) and EUR 400.000 for e5).

Call:

FP7-ICT-2013-10

Objective ICT-2013.5.2 Virtual Physiological Human

This objective focuses both on consolidation of the VPH effort started in previous work programmes and on bridging towards Horizon 2020. In consolidating the VPH results, a particular focus will be put on the clinical and personal use of the VPH technologies. The preparation of future research activities are also expected through road mapping.

Target outcomes

- a) **Clinical proof of concept of patient specific computer based models.** The current VPH research is based on the development of ICT technologies supporting multi-scale modelling and simulation of human organs or systems, aggregating information from multiple biological levels. The clinical objectives in using patient specific computer based models aim at early diagnosis, prediction of disease behaviour and evolution and treatments outcomes. The target is to re-enforce these clinical objectives through further ICT development for a translation and deployment of VPH models into the clinical environment. The work should target the development and integration of software technologies and human-computer interaction techniques into decision support and treatment planning system based on patient specific models of organs or diseases to be directly used by the healthcare professionals. The work focuses on small scale clinical as well as pre-clinical validation/trials demonstrating and providing clinical evidence of the benefits of the use of computer based models.
- b) **Personal Health Forecasting** for personalised health status monitoring and prediction. The Digital Patient is a digital representation of the integration of multi-scale computer based models of several organs, systems or diseases. The personal health forecasting will make use of the Digital Patient based on existing representations of multiple organs or systems and will provide to the citizen the next generation welfare services. Projects should address the development and integration of decision support system based on Digital Patient, associated with on-line service to allow for prediction of the evolution of patient health. The citizen will have access to on-line services based on VPH models processing

constantly the patient specific data collected by personal health systems and experience them in real time. The work focuses on demonstrators/pilots for personalised well being, monitoring and prediction of chronic conditions based on predictive models. It could also be applicable to the lifestyle management, wellbeing and disease prevention. Research may also engage in predictive data mining from sensor data, and self-reported health and activity assessment and other potentially heterogeneous data sources to discover risks to people (for example with chronic illnesses) that are not disease specific.

- c) **One Coordination and Support Action** to develop an RTD roadmap preparing the ground for **in-silico clinical trials**. In-silico clinical trials aims at using computer based models to simulate how patients cohorts would react to new treatment, new drugs. The different impacts of these new technologies and approaches should be explored. **The work focuses** on roadmap to research and develop methodology to define the role and impact of computer based models in in-silico clinical trials. The full roadmap will consist of investigating the needs, the vision, the gaps, the impact and the research agenda.

Expected Impact

Common to target outcomes a) & b)

- Increased confidence in decision support systems based on predictive models;
- Significant reduction of costs through the use of VPH technologies applicable to early diagnosis, prediction of disease and treatments outcomes.

For target outcome a)

- Strengthened evidence of the clinical benefits in using computer based models.
- Stronger evidence of the clinical impacts of disease prediction
- Acceleration of the deployment of VPH technologies in clinical environments.
- Increased acceptance and use of predictive models by healthcare professionals.

For target outcome b)

- Increased acceptance and use of predictive models by patients or citizen.
- Stronger evidence of the usability of computer based models for patient or citizen.
- Wider deployment of VPH technologies and services to patient or citizen.

For target outcome c)

- Availability to the community of a research agenda on the in-silico clinical trials
- Reinforced leadership of European research in this field through higher visibility of results and recognition.

Funding Schemes

a) and b) : STREPs

c) One CSA

Indicative budget distribution

- STREP: EUR 30.9 million

- CSA: EUR 1 million

Call:

Objective ICT-2013.5.3 ICT for smart and personalised inclusion

This activity is a continuation of the previous Objectives on "**ICT for smart and personalised inclusion**" in the ICT WP 2011-12 and on "**Accessible and Assistive ICT**" in the ICT WP 2009-10. It bridges to Horizon 2020. Projects are addressing advanced research, integrating and further developing where necessary recent results from e-inclusion/e-accessibility domain and from interaction, enhanced learning and information management domains.

Target Outcomes

(a) Accessible and intuitive solutions for personalised interfaces to smart environments and innovative services designed for all, including people at risk of exclusion - notably persons with disabilities, with low levels of digital literacy/skills, and older persons.

The focus is on delivering accessible and usable ICT solutions in a portable and pervasive manner, encompassing devices, applications, services and smart environments. Potential application domains are, education, health, home and leisure, work, mobility and communication activities. The proposed work will include (i) principles, frameworks and architectures to deliver global inclusive services and environments through different infrastructures, personal devices and applications; (ii) repositories of population representative user profiles and innovative mechanisms for interface adaptation, to address personalised accessibility and usability; (iii) development tools to facilitate the integration of inclusive solutions in everyday life applications.

Emphasis will be given on the development of innovative interaction techniques based on technologies such as serious gaming, virtual/mixed augmented reality, crowd-sourcing, ambient intelligence, persuasive and affective interfaces. End-user support may integrate real-time monitoring of user needs to improve the user experience and learning potential and adapt contents and interfaces. The overall approach should allow the creation of an accessibility and usability ecosystem linking interface developers, device makers, service providers, environment designer and user communities.

Interoperability is essential and infrastructure specifications and related standardisation initiation are expected.

(b) Coordination and Support Actions:

b1) The work should focus on consolidation of recent results in Brain Neural Computer Interaction (BNCI) and on investigating new BNCI activities and synergies with relevant fields leading to enhancement of human functions in relation to motor, sensory, cognitive and mental disabilities. It should build on past and current roadmapping activities in BNCI.

b2) Industrial strategies and valuation of potential markets for eInclusion components and services, in particular for the web (including connected DTV), the telecom, and public interactive terminals.

b3) Coordination and harmonisation of development, evaluation and monitoring approaches for e-accessibility (including design-for-all and usability), targeting the web and the audio-visual media. Methods and techniques should include crowd-sourcing of content repair, re-usable components production and large scale automatic surveillance.

Expected Impact

Each proposal will present quantitative indicators or measures of success to quantify potential impact along the points listed below for the target outcome concerned.

For target outcome a):

- Novel accessibility solutions for user groups at risk of exclusion.
- Enhanced quality of life for people at risk of exclusion, including people with disabilities, older people and people with low digital literacy and skills.
- Strengthened possibilities of employment to non highly specialised professionals.
- Improved competitiveness of European ICT industry in the field of inclusive smart environments and services.
- Wider availability and effectiveness of developers' tools for creating inclusive smart environments (targeted to SMEs, key mainstream industrialists, open-source developers, and other less technical developers).

For target outcome b):

- Synthesis of results in the area of Brain Computer Interaction in EU and beyond, and provision of ideas for the future activities that could be supported by Horizon 2020 and that will position the EU researchers and industry in a leading role in this area.
- Industrial and economic strategies for eInclusion and design for all. Value demonstration and good-practice for public and private stakeholders to embrace e-inclusion. Enhanced policy strategies towards the adoption of e-Accessibility practices, and the production of components, tools, compatible infrastructures/architectures, and integrating services by the market, in particular for new technologies and channels (web on mobile, DTV, public terminals, etc).
- Empowerment of policy makers to monitor and of communities to participate in achieving accessibility and inclusiveness of information and public services.

Funding Schemes

a): IP/STREP; b): CSA;

Indicative budget distribution

IP/STREP: EUR 16.5 million, with the objective to support at least one IP

CSA: EUR 2.5 million. For each topic, up to one CSA will be selected with maximum duration of 24 months and maximum EC funding of EUR 1.0 million for b1), EUR 0.5 million for b2), and EUR 1 million for b3).

Call: FP7-ICT-2013-10

Objective ICT-2013.5.4 ICT for Governance and Policy Modelling

The public sector has a significant role in stimulating economic growth as has been evident from the current economic and financial crisis. At the same time, citizens and in particular the younger generation are becoming more vocal in monitoring and influencing policy decisions. Current ICT tools for collaborative governance and policy modeling show great opportunities for empowerment of citizens and increased transparency in decision-making. In addition, there is a growing need for research and innovation for future public services that will be a catalyst for growth and sustainability.

Target Outcomes

a) Research will focus on policy modelling and simulation for achieving productivity gains and innovation in public service provision through innovative use of ICT. Such modelling, simulation and prediction should also enable public administrations to develop policies for growth and investment strategies for next generation ICT for public services. This research will also address innovative ICT solutions that build on Web2.0/Web3.0 and social networking, crowd-sourcing and collaborative technologies.

The tools shall include innovative data mining functionalities to identify the emerging societal trends as a result of the economic environment, and should further advance crowd-sourcing techniques to engage citizens in sharing knowledge and expertise to collectively solve complex, large-scale problems in a distributed fashion.

The work in this area should also exploit the vast reserves of Europe's public sector collective and open data and knowledge resources, for new services.

b) Coordination and Support Actions.

b1) **Roadmapping of research on ICT for innovative public services and governance.** Apart from addressing Coordination & Support actions should specifically address road mapping of the use of ICT for innovative public services and their governance, in particular cross border services. Another relevant topic that should be addressed is the empowerment of the younger generations through ICT tools. These roadmaps shall point to implementation under Horizon 2020.

b2) Increased **collaboration, on Electronic Identification and Authentication**, in particular with the USA and Asia, that could be a leverage for European solutions worldwide, while ensuring data protection for the citizens. The action is expected to enhance dialogue with countries that have activities on eID and authentication, and to exchange good practices so as to spearhead European solutions for mutual benefit.

Expected Impact

- Improved take up of policy making tools by decision makers in public administrations
- Improved validation of the potential impacts of policies through evidence
- Stronger evidence of productivity gains and reduction of costs in the provision of public services
- Evidence of the younger generation contributing to policy formation/development through social media

- Increased take up of open and public data for provision of public services.

Funding schemes

Area a) STREP; area b): CSA

Indicative budget distribution

EUR 19 million

Call: FP7-ICT-2013-10

Objective ICT-2013.5.5 Collective Awareness Platforms for Sustainability and Social Innovation

Target Outcomes

The objective is to stimulate and support the emergence of innovative ICT based platforms for grassroots Social Innovation, providing *societally, environmentally and economically sustainable approaches and solutions to tackle societal challenges*. Such collective intelligence platforms will include collective decision-making tools and innovation mechanisms allowing and encouraging individual and community creativity, participation and situational awareness.

The vision is that individuals and groups can more effectively and sustainably react to societal challenges by acting on the basis of a direct extended awareness of problems and possible solutions. To foster this, the objective has an experimental approach where concepts and tools are developed and verified in real world cases.

This will be achieved through the following set of complementary and interdependent actions:

- a) **Supporting grassroots experiments and prototypes** enabling citizens and communities to create and engage in digital social innovation platforms. These platforms should combine *i) open/federated social networking systems, ii) cooperative creation and sharing of knowledge and iii) real-time gathering and management of information coming from people and their living environment (e.g. country, city, home)*. Possible applications could focus on sustainability (as understood in the wide sense defined above), in e. g. citizen empowerment, health, ageing and well being, inclusion, environment protection, direct democracy, sustainable lifestyles and collaborative management of public goods. Open approaches, including free software, open hardware platforms and open data infrastructures, are strongly encouraged.
- b) **Support** bottom-up social innovation and education initiatives based on crowd-sourcing and network intelligence principles, carried out by web innovators, research teams, communities and entrepreneurs. The IP foreseen for this will select the activities to be funded through open calls, based on a combination of excellence (based on novelty and societal dimension of the actions proposed) and crowd funding mechanisms.
- c) **Engaging citizens and society at large** (Coordination Actions), aiming at:
 - distilling the best practices from existing and new initiatives, creating synergies and critical mass, and targeting the integration of the various approaches to solve significant societal challenges;

- assessing the impact of the actions on communities allowing broad uptake of societal innovation, representing an empirical approach to the new topic of collective awareness platforms for sustainability and social innovation;
 - achieving a multi stakeholder approach, helping social entrepreneurs get in touch with seed funding, e.g. through Venture Capital Networks or crowd-sourcing platforms;
 - broadening the societal debate about the ethical aspects of societal sustainability e.g. on the fundamental rights of the citizens resulting from the digital transition, in terms of quality guarantees from collective systems;
 - linking the existing and emerging initiatives with regulatory and policy activities on privacy and identity, open data, network neutrality, competitiveness, copyright, and alike, to be able to suggest sustainable approaches based on collective awareness.
- d) **Integrating the scientific base for the multidisciplinary understanding of collective awareness platforms for sustainability and social innovation**, addressing innovative mechanisms for value creation beyond monetisation, reputation, motivation and incentives for online collaboration and sustainable collective behaviours, innovative licensing, open government, new forms of "self-regulation" based on individual situational and contextual awareness of global social constraints, self-configuration of communities.

Expected Impact

The overall expected impact is the emergence and take-up of new sustainable organisational and behavioural models at individual and community levels, resulting in sustainable social and economical innovation improving the quality of response to societal and economic challenges, such as growth, employment, inclusion, education, community development, health, environment, energy, and quality of life at large.

Specific impacts are:

- Catalyzing and enabling new production and consumption patterns, lifestyles, and socio-economic processes based on commons, sharing, exchange, and participation at local and global scales.
- Definition of new concrete mechanisms increasing society's resilience, enabled by a more accurate understanding and management of social and environmental problems.
- Strengthened evidence of social innovation based on collective knowledge, which can also make possible new forms of foresight in society (by public bodies, organisations as well as by citizens).
- Providing advanced concepts and tools enabling people and communities to share, collaborate, and make use of data/information generated, empowering future social entrepreneurs and innovators to engage in innovative service creation and delivery.
- Contributing to the emergence of new forms of political expression, "self-regulation", innovative business and economic models and social entrepreneurship.

Funding Schemes

a) STREP

b) 1 IP devoting min. 85% of its budget to open calls, max. 7% to coordination and max. 8% to coordination and visibility actions.

c, d) CSAs

Indicative budget distribution

STREPs (indicatively 0.5 to 2 M€ each): 9 M€. In the selection of the STREPs to be funded a good coverage of different methodological and topical approaches is expected.

IP: 3 M€

CSA 3 M€

Call:

FP7-ICT-2013-10

7.6 Challenge 6: ICT for a low carbon economy

This Challenge explores opportunities for harnessing digital technologies to address climate change, especially to increase energy efficiency and to better manage our water resources. It supports speedy progress towards the EU's energy and climate objectives for 2020 while simultaneously supporting existing and opening new business opportunities. The main role of ICT is reducing resource consumption and CO₂ emissions, in particular related to electricity and water distribution, the built environment, transport and logistics. Particular attention is given to cities as platforms for innovation, encouraging the validation of integrated solutions in user-driven, open innovation environments.

The Challenge focuses on the following:

- Future electricity distribution grids fostering synergies between telecommunication and energy networks to increase automation and to improve coordination between production (including renewable sources), distribution and transmission. The focus is on data management and special attention is given to potential new business models for DSOs (Distribution Systems Operators).
- Data Centres in an energy-efficient and environmentally-friendly Internet. This addresses technologies and associated services to monitor energy consumption and automatically optimise power, cooling, computing, storage, and data transmission operations in function of energy consumption, environmental impact and cost policies. It also covers technologies for the integration of renewable energy sources and reuse of heat.
- Water resources management focuses on ICT-enabled demand-side management and resource efficiency solutions, in an integrated water resources management context. Special attention is given to improving household awareness and modifying consumer behaviour as well as the corporate and government actions in response to demand modifications.
- Smart Cities. The aim is to integrate and validate ICT technologies and services in neighbourhoods to make progress towards carbon neutrality in cities. The idea is to develop ICT able to provide intelligence to electricity grids, to district heating and cooling grids, to storage and renewable energy sources from a single system point of view. In addition to technical developments, attention is given to innovative service business models taking into account data security and privacy. Behavioural sciences are a core activity with a view not only to observing subjects but to soliciting innovative ideas from them. This research will contribute to the Energy-Efficient Buildings Public-Private-Partnership launched in 2008 as part of the European Economic Recovery Plan and it is part of the Smart Cities initiative coordinated with Theme 5 (Energy).
- Co-operative mobility is the interconnection of users, vehicles and infrastructure that enables the creation and sharing of new kinds of information, leading to a better cooperation amongst mobility users. Focus is on supervised automated driving for improving both the energy efficiency and safety of individual and public transport and on energy-efficient, safe and accessible services to enhance mobility of citizens.

- Electro-mobility: This objective contributes to the Public Private Partnership "European Green Car Initiative". Related to the fully electric vehicle, it addresses architectures for electronics in the car; and comprehensive energy management systems for its infrastructure integration.

Objective ICT-2013.6.1 Smart Energy Grids

This objective explores the potential of bringing together stakeholders from both the energy utilities and the telecom sector to develop common approaches for future digital networks and smart energy services infrastructure for electricity distribution. The focus is on data management including the exchange of information with transmission network operators and with end users. Special attention is given to exploring new business models for DSOs (Distribution System Operators).

Targeted Outcome:

Intelligent systems built over existing and future telecommunication networks and services that will assist in the management of the electricity distribution grid in an optimized, controlled and secure manner.

Key research challenges to be addressed:

- a) Sharing of backbone infrastructure and last mile connectivity, considering not only technologies (e.g. LTE, GPRS, PLC, and possibility for spectrum allocation) but also the appropriate business models to deliver significant cost and investment savings.
- b) Improving robustness and reliability of the existing telecommunication infrastructure in order to cope with mission critical services that require milliseconds response times. Explore the possibility of deploying dedicated services on shared telecoms infrastructure, rather than entirely new infrastructure.
- c) ICT technologies for active electricity network management, demand/response, load balancing and forecasting and congestion management. Developing a methodology for capacity calculation.
- d) Developing telecommunications services and platforms specific for energy distribution taking into account control of access to customer information and consumer data, in particular smart metering data; data ownership and associated level of security and use of data; business models; system reliability; long term availability; and avoidance of vendor lock-in.

Project should focus on one or a combination of the previous points. Consortia must be compact with partners each making substantial contributions and with expertise in both telecoms and energy domains. In all cases, projects shall include an appropriate validation phase to draw conclusions for future deployment.

Expected Impact:

- Reduction of the percentage of energy lost during energy distribution;
- Reduction of the gap between energy produced and energy consumed;

- Increase of renewable energy sources and Combined Heat and Power - CHP connected to the distribution grid;
- Reduction and shifting of peak loads;
- Number of publications jointly authored by researchers from ICT and energy.

Funding schemes

STREP

Indicative budget distribution

STREP: EUR 18 million

Call: FP7-ICT-2013-11

Objective ICT-2013.6.2 Data Centres in an energy-efficient and environmentally friendly Internet

The action will address system level technologies and associated services that will improve the energy and environmental performance of data centres. Given that data centres are a core element of today's Internet and among the facilities with the highest rate of increase energy consumption and related environmental impact, the action will contribute to a more energy efficient and environmentally friendly Internet.

While computing is addressed under several challenges of this Work Programme, work in this objective focuses on energy and environmental performance of data centres. It is therefore complementary to the work under Objective 1.2 related to computing architectures for future cloud services, Objective 3.4 addressing computing systems for embedded systems and for data centres, and Objective 12.1 related to exa-scale supercomputing.

Target Outcomes

- (a) Software and Hardware system level technologies and associated services that monitor energy consumption and automatically optimise power, cooling, computing, storage, and data transmission operations in function of energy consumption, environmental impact and cost policies.
- (b) Systems for the integration of networks of renewable energy sources for powering data-centres situated in urban agglomerations.
- (c) Systems for the efficient use by urban installations of the heat that is produced by (a network of) data centre(s).
- (d) Efficient integration of data centres under smart grid/smart city schemes.
- (e) Contribution to standard and industry bodies that develop methods and standards on the measurement of the energy and environmental footprint of data centres. An emphasis on interoperability between different methods/standards will be considered an asset.
- (f) Appropriate validation of the resulting systems. Based on defined indicators, during this phase, projects shall record evidence of energy savings and CO₂ emissions reductions, total cost of operations versus

potential benefits, user acceptance and replication potential and extract lessons that may be used in different settings.

All proposals will address as minimum sub-topics (a), (e) and (f) and at least two of (b), (c) and (d).

Consortia must be compact with partners each making substantial contributions. In addition to partners with expertise on ICT, consortia will include partners with expertise on energy.

Expected Impact

- Quantifiable and significant improvement (well beyond what would be achieved under normal evolution conditions) of the overall resource efficiency of data centres. Improvement in this context of their power usage effectiveness (PUE) with a parallel improvement of their environmental effectiveness (indicative metrics can include emerging ones like carbon usage effectiveness (CUE) and water usage effectiveness (WUE)).
- Development at demonstration stage of (networks of) Data Centres powered at levels of 80% or above by renewable energy sources.
- Contribution to the creation of new market opportunities (e.g. in the area of renewable energy systems for data centres).

Funding schemes

STREPs

Indicative budget distribution

EUR 20 million

Call

FP7-SMARTCITIES-2013

Objective ICT-2013.6.3 ICT for water resources management

ICT offers an untapped potential to improve the management of water resources by integrating real-time knowledge about water consumption at domestic, corporate and city level, and by enabling subsequently the implementation of efficient resource and demand management strategies and pricing schemes. This objective brings together the ICT and water stakeholders in joint research, in order to document the ICT potential via lessons learned from real-life testing and demonstration experiments.

Targeted outcomes:

The aim is to pilot and demonstrate innovative ICT systems and services for efficient water use and reuse, in order to improve household, business and societal awareness, to induce changes in consumer behavior and to enable the introduction of innovative resource and demand management schemes and adaptive pricing incentives.

Key research challenges to be addressed include:

a) Providing quantifiable evidence of the potential of ICT to contribute to efficient water resources management by increasing household, business and industry

awareness regarding water use, triggering the adoption of new demand management and pricing schemes, and contributing to meeting EU resource efficiency targets in a digital society.

b) Validating ICT-enabled innovations in real-life operational settings with the active involvement of stakeholders and end users from the water and the ICT domain; demonstrating in public the ICT potential for efficient water use, assessing its impact at domestic, corporate or municipality level, and exploring possible business case scenarios.

Projects should cover: (i) new ICT research and/or innovative integration of ICT-enabled solutions for water resources management at domestic, public/private building industry and/or city level, (ii) substantial validation of the proposed ICT solutions in at least two real-life operational environments, over a sufficient period of time to cover seasonal variations, and with the involvement of real users from the responsible water operators, households and the ICT industry, (iii) assessment of impact of the proposed solutions and preparation of a business case including open access options and possible take-up activities, and iv) a final dissemination event, including a public demonstration and a "hands-on" training of targeted users.

Consortia must be compact with partners each making substantial contributions. In particular, the stakeholders from water authorities/operators and from the ICT industry should have key roles in the validation and business scenario stages.

Expected impact:

- Increased user awareness and modified behaviours concerning the use of water;
- Quantifiable and significant reduction of water consumption;
- Peak-period reduction of water and energy distribution loads;
- Improved resource efficiency and business operations of water utilities due to ICT;
- Increased rate of ICT-innovation in water management companies;
- Number of publications jointly authored by researchers from ICT and the water domain.

Funding schemes:

STREPs

Indicative budget distribution

STREP EUR 14 million

Call

FP7-ICT-2013-11

Objective ICT-2013.6.4 Optimising Energy Systems in Smart Cities

Cities are increasingly recognized for their ability to play a catalytic role in addressing climate and energy challenges using technologically innovative approaches. This can be achieved by creating new partnerships connecting city leaders and stakeholders to secure practical commitments for implementing green digital agendas.

Projects supported under this objective shall contribute to the Energy-Efficient Buildings Public-Private-Partnership launched in 2008 as part of the European Economic Recovery Plan. This objective is part of the Smart Cities initiative with Theme 5 (Energy). In particular it is complementary to the topic "Demonstration of Optimised electricity and heating/cooling systems". Here the focus is on software systems for new business models and user engagement whereas in Theme 5 the focus is the physical integration (including power electronics devices).

Target Outcomes

a) Decision-support systems and/or management and control systems for energy-efficient neighbourhoods. These systems shall consider de-centralised renewable energy production, connection with the smart electricity grid and integration with smart district heating and cooling grids through CHP (Combined Heat and Power) and other renewable energy sources. They shall optimise the use of energy in city areas with different types of demand to enable local balancing, demand response services, variable tariffs and easy change of supplier.

In addition to technical work, proposals shall consider appropriate service business models, privacy and trustworthiness and shall involve users throughout all phases of the project. They are to be considered not only as observed subjects but also as a source of innovation. Systems should be built considering openness and interoperability up front. Both behavioural sciences and economics are to be core activities.

Proposals should cover (i) technical developments, mainly adaptation and integration of existing ICT, (ii) a substantial validation phase in real-life environments in at least two cities and (iii) a precise evaluation phase where proposals shall record evidence of energy savings, total cost of operation, scalability of the solutions, user's acceptance, benefits that accrue, and extract lessons for those planning to deploy and finance such systems.

Considerable resources are expected to be committed, however consortia must be compact with partners each making substantial contributions.

b) Coordination and Support Actions: Bringing together relevant stakeholders including process engineering specialists, ICT software and equipment providers, RES providers, energy companies (including ESCOs - Energy Service Companies), building and construction sector companies, as well as local and regional authorities, to:

- Take over the work done by ICT4E2B Forum and IREEN and extend their roadmaps from buildings and neighbourhoods to smart cities and extended urban/rural communities in a holistic dimension;
- Analyse the relationship between producers, distribution companies and consumers of energy in particular new business models and opportunities for SMEs. Identify best practices and opportunities for knowledge transfer.
- Identify ICT/Energy vocabularies and ontologies to foster interoperability of Energy Management Systems related to the building and construction domain, and beyond the building into public spaces, neighbourhoods and districts, and analyse their relevance and possible evolution towards formal standards; analyse their potential extension to energy management in industry and commerce. Work has to

build on the results of the previous Workshops on Energy Efficiency Vocabularies²⁷.

- Assess possibilities for making publicly available data obtained from validation activities; work proactively together with project consortia towards this end and assess relevant legal requirements around data protection.
- Support the establishment of European-scale actions spanning research, innovation, standards-setting and deployment in Smart Cities

The tasks shall include drafting and up-dating public documents, organising expert hearings and workshops, dissemination and networking events.

Expected Impact

- Quantifiable and significant reduction of energy consumption and CO2 emissions achieved through ICT.
- Adoption of ICT by city authorities;
- Number of publications jointly authored by researchers from ICT, energy, construction and civil engineering and city experts.

Funding schemes

a) STREP; b) CSA

Indicative budget distribution

STREP: EUR 39 million

CSA: EUR 1 million

Call

FP7-SMARTCITIES-2013

Objective ICT-2013.6.5 Co-operative mobility

The objective is to make use of co-operative mobility technologies to develop supervised automated driving which is expected to be the most viable long-term option for improving both the energy efficiency and safety of individual, public and freight transport by smoother, better informed driving and behavioural change.

Target Outcomes

a) Supervised automated driving

The target is to develop and demonstrate fault-tolerant and resilient supervised automated driving technologies and applications to address issues such as driver take-over situations, automated stop-over to a safe location, rendering the behavior of an automated vehicle predictable for other road users; use of smart lanes or existing dedicated lanes where automated vehicles can circulate under geographical separation or time limits. Research and innovation shall build on and integrate advances in co-operative systems, driver assistance systems, dependable control systems, embedded and sensor systems, and human machine interfaces. Besides technologies and infrastructures required for supervised automated

²⁷ http://ec.europa.eu/information_society/activities/sustainable_growth/buildings/index_en.htm

driving, proposals should as well address the associated socio-economic, standardisation, and legal issues.

b) Coordination and Support Actions

Make data captured from large scale field operational tests available for data mining and analysis; develop and pilot training programmes and curricula for enhancing the human machine interaction using different levels of automation in the connected car; develop and build consensus on business models for the deployment of automation in public/personal road transport; international co-operation activities based on existing international arrangements in particular with the US and Japan.

Expected Impact

- Supervised automated driving demonstrated in several EU locations showing measurable effects on energy efficiency and safety.
- Increased level of user acceptance of automated driving.

Funding Schemes

- a) IP, STREP: it is expected that a minimum of one IP is selected.
- b) CSA

Indicative budget distribution

- a) EUR 23 million
- b) EUR 3 million

Call:

FP7-ICT-2013-10

Objective ICT-2013.6.6 Integrated personal mobility for smart cities

Target Outcomes

Integrated personal mobility for smart cities

Research should build on existing technologies for in-vehicle platforms and traffic management resources and integrate these with transformative technologies such as future internet and cloud computing to capture, store, process and communicate increasing quantities of information. Mobility is seen in a broad sense and could include non-motorised transport modes, electromobility and public transport, combined use of multiple modes of transport, virtual mobility concepts, and innovative mobility sharing schemes. The information used may come from traffic management systems, connected vehicles, the surrounding infrastructure and from mobility users including floating car data and crowd sourcing information. Proposals shall demonstrate the value of new services and business models through pilots involving end-users, paying attention to aspects of data privacy and security of the digital citizen.

Expected Impact

- Increased take-up of transformative European ICT in new mobility services.
- Energy efficiency gains in personal mobility demonstrated when using new mobility services.

Funding Schemes

STREP

Indicative budget distribution

EUR 15 million

Call:

FP7-SMARTCITIES-2013

Objective GC-ICT-2013.6.7 Electro-mobility

The European Green Car Initiative (EGCI) is part of the European Economic Recovery Plan launched in November 2008 to respond to the global economic crisis. This Public-Private-Partnership (PPP) aims at demand-side measures to support the development of new and sustainable forms of road transport. The ICT contribution to this initiative aims at improving the cost- and energy-efficiency of the fully electric vehicle and its value chain through the application of advanced ICT. Objective 6.7 under ICT and relevant objectives under NMP, Environment, Energy and Transport are co-ordinated and jointly support the EGCI PPP.

This objective addresses fully electric vehicles (FEV), meaning electrically-propelled vehicles that provide significant driving range on purely battery-based power. It includes vehicles having an on-board electrical generator as range extenders. The objective also covers small light-weight passenger and duty vehicles. Projects supported under this objective should advance the research, development and integration of major building blocks for the FEV, and for its infrastructure integration.

Target outcomes:

a) Advanced System Architecture for FEV

New or expanded functionality of existing hard and software architectures for electronics leading to radical cost reduction, reduced complexity, increased reliability and flexibility and higher energy efficiency.

Advanced concepts for the integration of multiple functionalities into smart subsystems for energy storage, traction, and power control including e.g. bi-directional energy transfer (managed/controlled charging), energy recovery and improved road handling. Work shall address the re-design of the electric and electronic architecture; assessment of the implication for safety, security, reliability and robustness of the electric power train operation including EMC and the development of related international standards; the usage of low power consuming cooperative systems for cost efficient, real-time and safe operation of the vehicle.

Also included are technical solutions facilitating recycling and reuse of components; standardised, cost-efficient and reproducible testing concepts for vehicles and subsystems; ICT solutions for cost efficient, flexible production of small volume,

customised (sub-) systems and vehicles driven by the different requirements of different customers.

b) Comprehensive Energy Management

ICT for optimising the energy system inside the FEV and the connectivity of the FEV using Comprehensive Energy Management Systems including efficient vehicle-based solutions for grid and road integration taking into account aspects of autonomous driving and integration in cooperative systems as appropriate.

Increased synergies of electric traction, autonomous driving and cooperative road-vehicle systems for energy-, cost- and time-efficiency as well as safe operation of the vehicle including autonomous positioning or guiding are targeted. Work shall address alternative, innovative ICT-based solutions for optimised recharging interfaces and methods (inductive; continuous; fast; en route) and include vehicle-based energy harvesting and the management of combinations of different energy sources and storage as well as the management and optimisation of energy storage ageing, charge monitoring and certification of energy content. Projects in this field are expected to establish cooperation and to coordinate with relevant projects under NMP, Environment, Energy and Transport to jointly support the EGCI PPP.

Also included are the assessment of related safety and health concerns regarding the use of electric vehicles; work towards common user interfaces including privacy and data security standards for flexible subsystems and mobile devices (smart phones, tablets etc.) and the contribution to standards e.g. for dynamic and bi-directional energy exchange between the vehicles and the smart grid.

c) Coordination and support actions

Business models for the deployment of FEV in public, personal, and freight transport; pilot educational and training programmes and curricula; stimulation of the international dimension for European FEV and the global presence of SMEs; and contribution to the setting of standards are envisaged. Proposals should predominantly address SME activities.

Expected impacts:

- Improved energy efficiency and extended driving range of the FEV
- Increased performance and reduced costs of the electronic components and the overall FEV produced in Europe.
- Better integration of the FEV in the smart grids and cooperative infrastructure
- Significant improvement of FEVs' safety and comfort
- Strengthened global competitiveness of the European automobile, ICT and battery sectors; significant market penetration of key components of FEVs.

Funding schemes

a), b) IP, STREP: It is expected that at least one IP is selected per target outcome. Individual proposals may address both target outcomes.

c) CSA

Indicative budget distribution

IP, STREP: EUR 39 million

CSA: EUR 1 million

Call:

FP7-ICT-2013-GC

7.7 Challenge 7: ICT for the Enterprise and Manufacturing

The Factories of the Future (FoF) initiative is part of the European Economic Recovery Plan launched in November 2008 to respond to the global economic crisis. This Public-Private-Partnership (PPP) aims at helping EU manufacturing enterprises, in particular SMEs, to adapt to global competitive pressures by improving the technological base of manufacturing across a broad range of sectors. The ICT contribution to this initiative aims at improving the efficiency, adaptability and sustainability of manufacturing systems as well as their better integration within business processes in an increasingly globalised industrial context. Both Challenge 7 and the relevant Challenge under NMP are supporting the FoF PPP in a co-ordinated manner and are focusing on actions with a strong innovation dimension.

The aim of Challenge 7 is to give support to industry for bringing together ICT suppliers and users for experiments that target the broad uptake of ICT towards a more sustainable, efficient, performant, and smarter European manufacturing industry. Focus is on emerging innovative technologies and processes, which need to be customised, tested and validated before being able to compete on the market. Special emphasis is on strengthening European SMEs, both on the supply and on the demand side.

Two types of take-up activities are supported at **technology level**. Both aim at bringing together relevant actors from the use and the supply side, supported by competence centres as appropriate.

- **Application experiments** will target advanced robot solutions for new manufacturing applications as well as simulation services for engineering and manufacturing SMEs including a cloud-based service infrastructure that provides the needed high performance computing resources (Objective 7.1).
- **Assessment experiments** will target innovative sensor-based equipment solutions in manufacturing and control, and innovative laser applications in manufacturing (Objective 7.2).

For both types, experiments are expected to make the most effective use of funding with explicit and immediate impact in the shortest possible time. Activities are expected to be clustered in larger projects to achieve critical mass and to better exploit EU-added value. Common tasks include: targeted dissemination; management of calls for new actions; exploitation of synergies across actions. To better cope with the speed of innovation in ICT, implementation must be flexible and fast. Part of the actions and partnership are to be defined from the outset, while additional experiments or users, may be identified through open calls during the action (max. 50% of the total budget).

To facilitate the emergence of a European **innovation ecosystem**, a network of innovation multipliers competent in manufacturing is to be established across all take-up projects emerging from the objectives of Challenge 7 with an aim to achieve broad coverage in technological, application, innovation, and geographic terms, thereby maximising the impact of the actions and addressing the needs of SMEs. Its tasks and services shall include establishing a single innovation portal for newcomers; sharing of best practices and experiences; dissemination; and brokering between users and suppliers in view of open calls. The participation of actors, e.g. regional innovation

clusters, chambers of commerce, societal actors, industrial associations, technology transfer departments of large research labs, which usually do not participate in research projects or programmes is encouraged. This cross-objective action is described under Objective 7.2 c).

Objective FoF-ICT-2013.7.1 Application experiments for robotics and simulation

All projects under this objective shall carry out a critical mass of vertical application experiments related to robotics or simulation, complemented by horizontal support services: Driven by the requirements of first-time users, individual experiments shall bring together all actors of the value chain necessary to equip new users with novel products or services and assist them in customising and applying these in their respective environments, e.g. first time users, application experts, technology suppliers, system integrators, and service providers. Special emphasis is on SMEs, both on the supply and the demand side. Proposers are referred to the general description of take-up actions in the introduction to this Challenge.

Target outcomes:

a) Robot solutions for new manufacturing applications

Experiments shall showcase the take-up, integration and evaluation of methods, components, and tools reflecting the paradigm shift in industrial robotics, away from immobile, large-sized, pre-programmed robots to more flexible, energy efficient and adaptable service robots (e.g. lightweight, mobile systems). Experiments should target key functionalities such as mobility, reconfigurability, dexterity, safety and human-robot interaction, and focus on downstream activities like systems integration, testing and validation under realistic manufacturing conditions. In areas such as manufacturing, service, maintenance and repair, or monitoring and control, application scenarios must be well motivated in technical terms and exploitation potential. Experiments shall be innovative, e.g. in terms of integrating new materials, advanced sensors and control technologies in robotic systems.

b) Simulation services for engineering and manufacturing

Experiments shall showcase the customisation and adoption of HPC-cloud-powered simulation services by users, particularly SMEs. Innovation shall be addressed at three levels: (1) Users get a "one-stop-shop" access to simulation technologies novel for them, including expertise and tools for visualisation, analytics, customisation and integration; and dynamic, easy and affordable access to computing resources; (2) as business owners, independent software vendors and simulation service providers, supported by competence centres, port their applications to a cloud of HPC resources and run experiments with those cloud-based service and business models in controlled environments; (3) HPC resource and service providers join forces in providing, across experiments, a prototype of a sustainable European commercial cloud of HPC resources in manufacturing and engineering including the necessary orchestration and access services. An operational prototype of the targeted cloud infrastructure is expected to become operational at an early stage. HPC-cloud providers shall build on existing infrastructures as far as appropriate.

c) Constituency building and road-mapping:

Building constituencies and developing broad research and innovation agendas in areas such as (i) analytics, simulation, and forecasting technologies deployed in manufacturing and engineering; (ii) architectures and services integrating agile and flexible manufacturing processes into distributed, interoperable, "green", and context aware enterprises of the future.

Expected impact:

- Strengthened global competitiveness of EU manufacturing SMEs in terms of innovative high quality products and services at affordable manufacturing costs and prices through adoption of advanced robotics and simulation technologies.
- More competitive European technology and service providers through wider opening to the SME market in the manufacturing sector and through opportunities to experiment with new business models.
- Wider adoption of cloud infrastructures in Europe in a large niche market segment important for Europe's economy.

Funding schemes:

a), b): IP – it is expected that minimum one IP is supported for each target outcome.

c) CSA

Indicative budget distribution

- IPs: EUR 33.5 million
- CSA: EUR 1.5 million

Calls:

FP7-2013-NMP-ICT-FoF

Objective FoF-ICT-2013.7.2: Equipment assessment for sensor and laser based applications

All projects under this objective shall carry out a critical mass of equipment assessment experiments related to laser or sensor-based tools. Suppliers of innovative high-tech equipment are expected to install and assess their prototypes or products in production-like environments and validate them in a manufacturing line or in an industrial environment that is very close to manufacturing conditions. The primary aim is to strengthen the ICT equipment supplier base, predominantly SMEs, through a close cooperation with globally acting manufacturers, by improving the manufacturing processes in relation to quality, speed, environmental and resource efficiency. Equipment assessments require the following steps: (i) definition of requirements for a specific application scenario; (ii) establishment of productivity metrics and (iii) assessment of experiences and results. Special emphasis is on SMEs on the supply side. Proposers are referred to the general description of take-up actions in the introduction to this Challenge.

Target Outcomes

- a) **Intelligent equipment solutions in custom manufacturing and/or re-manufacturing:** Equipment assessment of sensor-/actuator-driven equipment targeting smart production flexibly through an effective monitoring and control of small volume, small lot size customisation requirements and/or end-of-life manufacturing operations – such as dismantling, recycling, material reuse. The assessment framework shall address improvements related to precision, speed, cost, flexibility and efficiency of (re-) manufacturing operations.
- b) **Innovative laser applications in manufacturing: Equipment assessment** of all equipment relevant to laser manufacturing such as the laser itself, power supplies, handling tools, beam guiding/manipulation and quality, sensors to monitor the equipment and manufacturing process, periphery in general (materials, housing, safety issues etc). The assessment framework shall address improvements related to quality, speed, flexibility and resource efficiency of laser-based manufacturing and processing.
- c) Establish a network of **innovation multipliers** in the manufacturing sectors across all take-up projects of this Challenge taking an interdisciplinary approach to achieve broader technological, applications, innovation, and regional coverage thereby maximising impact and addressing better the needs of SMEs.
- d) Support a rapid **build-up of new manufacturing skills:** training methodologies and ICT-based tools to attract the interest of young talents in manufacturing and engineering.

Expected Impact

- Reinforced ability to penetrate new application areas (e.g. high customisation, end-of-life product engineering and manufacturing), close to the market and opening new markets
- More competitive supply-side SMEs able to supply manufacturers with new equipment and components for improved manufacturing operations.
- Higher innovation capacity and competitiveness of European producers of laser manufacturing equipment and their suppliers, in particular SMEs, and of the users of such equipment.

Funding schemes:

a), b): IPs – it is expected that minimum one IP is supported for each target outcome.

c), d) CSA

Indicative budget distribution

- IPs: EUR 33.5 million
- CSA: EUR 1.5 million

Calls:

FP7-2013-NMP-ICT-FoF

7.8 Challenge 8: ICT for Creativity and Learning

The culture and creative industries are a powerful motor for jobs, growth, exports and earnings, cultural diversity and social inclusion, representing 4.5% of total European GDP and accounting for 3.8% of the workforce. European industries, in particular small and medium enterprises, are increasingly faced with the need to be more productive, innovative and dynamic in responding to the changing market needs.

This challenge calls upon research and industry to unite their forces to produce more powerful and interactive tools for creative industries, enhance the creativity of workers pursuing different professions, and anticipate future trends in research and innovation by encouraging interaction in and between different segments of the creative industries.

One goal is to create a vibrant creative technology ecosystem and increase the innovation capacity of European industries and enterprises by providing them with better tools, capabilities and foresight. A further goal is to enhance, develop and encourage creativity as an essential 21st century skill in professional contexts.

Education is a strong prerequisite for economic growth. Europe must support national efforts to help students to learn better, teachers to teach better, and school systems to become more effective. We need customised learning systems that can adapt to effective use in a wide variety of diverse contexts. This is key for a successful modernisation of educational and training systems in Europe.

Objective ICT-2013.8.1 Technologies and scientific foundations in the field of creativity

Target Outcomes

Research under this objective will address creativity and the tools and environments in which it takes place. Research activities will contribute to equipping different industries with more effective creative tools, expand the potential of technology in the human creative processes and advance the scientific understanding of creativity thus providing the basis for future innovative technologies. This will be complemented by support activities that promote ways of closer interaction and networking within and between different segments of creative industries.

- a) **Creative experience tools** that make use of all our senses and allow for richer, more collaborative and interactive experiences: real time simulation and visualisation, augmented reality, 3D animation, visual computing, games engines, and immersive experiences. The tools created should be cost effective, with special attention to users like SMEs and individual creators, intuitive, and be demonstrated in real environments for the creative and cultural industries (such as advertising, architecture, arts, crafts, design, fashion, films, music, publishing, video games, TV and radio etc.).
- b) **Intelligent computational environments stimulating and enhancing human creativity:** Multi-disciplinary research (e.g. computational creativity, brain-based research, cognitive and learning sciences, HCI) should explore the potential of technology to enhancing human creative processes. Research

should address individual and/or collective creative processes in professional contexts involving domain-specific skills (in e.g. creative industries, engineering, medical professions). Work should establish theories and models for hybrid (human-computer) systems to be demonstrated by fully functional prototypes of computational environments. Proposals need to address the balance between scientific insights, technological innovation and practical application to the domain. Proposals should include sound methodology for the assessment and measurement of creative performance.

- c) **Progress towards formal understanding of creativity** with a view to advancing the measurable capability of computers to produce results assessed by humans as useful, original and surprising. Proposals should contribute to technological and theoretical insights on creativity, incorporating progress in relevant areas such as AI, psychology, sociology, neuroscience and cognitive science. Proposals should demonstrate how the theoretical insights gained in the project will contribute to the understanding of human creativity. Technological advances should be validated as proofs of concept in innovative autonomous creative systems aiming to rise above the level of pastiche (mimicry).
- d) **Roadmaps for future research and innovation** in the creative industries; proposals should target cross- and inter-cluster support activities to boost creative competitiveness in sectors such as advertising, architecture, arts, crafts, design, fashion, films, music, publishing, video games, TV and radio.

Expected Impact

- Improved efficiency of creative processes by two fold at least as regards time and resource investment, and quality of output.
- Improved competitive position of the European cultural and creative industries through the provision of cost effective, innovative and high-value products and services.
- Better understanding of the potential of technology in human creative processes leading to enhanced domain-specific human creative performance.
- Deeper scientific understanding of creativity, fostering the synergy between understanding and enhancing human creativity, and new technologies for autonomous creative systems.
- Better coordination of European and national efforts, closer dialogue between research and industry, better understanding of user requirements, more innovation and technology uptake.

Funding Schemes

- a) IP/STREP
- b) and c) STREP
- d) CSA

Indicative budget distribution

- Target outcomes a) and b) EUR 32 million, with a minimum of 40% for IPs and 30% for STREPs
- Target outcome c) EUR 10 million
- CSA: EUR 1 million

Call: FP7-ICT-2013-10

Objective ICT-2013.8.2 Technology-enhanced learning

Target Outcomes

Research under this objective targets tailored, scaled and tested R&D for stimulating the take-up of learning technologies in different learning contexts, reinforces the evidence-base of effectiveness of learning technologies and encourages their innovative use.

a) ICT-enabled learning environments: joint pre-commercial procurement (PCP) of innovative solutions for teaching national curricular topic(s) in primary and/or secondary education, based on latest advances in pedagogical, cognitive and other relevant scientific disciplines.

These solutions should:

- combine, and operate across different digital media and devices and stretch the boundaries of place, time, type and styles of active learning in the digital age;
- include rich and intuitive interfaces for teachers and students and simulations and representations for teaching, learning and communicating about the topic;
- adapt to different teaching practices and learning methods (e.g. collaborative, inquiry-based and personalised learning and 1:1 tutoring) and provide efficient support for the teacher in planning, monitoring, assessment and in the management of classroom activities.

The participatory design of the systems should involve all key stakeholders in the value chain, e.g. public authorities, researchers, developers and end-users, through iterative processes and take into account contextual variables that affect learning in particular contexts (e.g. local, regional and/or national situations, learner and teacher profiles, types and styles of learning). The proposed solutions should aim for wide adoption at local, regional or national level and their relevance and effectiveness for learning should be demonstrated by appropriate evaluation methods and benchmarking.

PCPs shall be implemented according to the conditions outlined in objective 11.1 and Appendix 6 and cover the full PCP life-cycle encompassing solution design, prototyping, and original development of a limited volume of products/services in the form of a validated test series. They should seek to contribute to standards in digital educational solutions.

b) Learning analytics, educational data mining: tools and processes for collecting, storing, exploring and reasoning on large-scale educational data to better understand learners' knowledge, assess their progress and evaluate environments in which they learn. These tools and processes should aim at improving learning and teaching (including 21st century skills) for students and instructors. These tools should be equipped with intuitive interfaces for visualizing and interacting with the data in order

to ease their integration into the practice of teaching and learning. Cognitive models of learning styles should be provided and tested against actual data sets that record inputs, behaviour and assessment outcomes. They should aim to use and develop standardised nomenclature and categorization for effective comparison of aggregate information from different sources.

c) Holistic learning solutions for managing, reaching and engaging learners in the public administrations.

These systems should:

- provide flexible and cost-effective solutions for adaptation to rapidly changing external/internal environment, changing task/competence requirements;
- support the development of performance culture, engaging the entire organisation at all levels, providing an efficient measuring method based on clearly defined performance metrics;
- aim to develop critical skills, including transversal skills such as effective communication, collaborative building of knowledge resources, critical thinking, self-management.

The solutions should be validated in public administrations. The use of open education resources as well as open source learning and rapid application development tools is encouraged.

d) Support for organising competitions for breakthroughs in the successful adoption and scaling-up of the use of innovative learning technologies in formal learning contexts for raising awareness at European level about effective methods and technologies for learning.

Expected Impact

- Broaden use of ICT in education in at least one curricular topic leading to wider take up by end-users;
- Effective public-private partnerships for providing digital learning solutions in Europe;
- Stronger growth of the European ICT-enabled learning markets;
- More efficient use of ICT for learning through the exploitation of learning analytics tools;
- More timely and effective acquisition of skills/competences through learning technologies, in public administrations, indicated a.o. through % of decrease in time to proven competency and in time to carry out the tasks, and % of savings in study time;
- Increased awareness on the benefit of the adoption of learning technologies.

Funding Schemes

a) CP-CSA, b) STREP, CSA, c) IP/STREP d) CSA (CA only).

Indicative budget distribution

- CP-CSA, IP/STREP: EUR 22 million, of which a minimum of 25% allocated to CP-CSA (max 25% for the CSA part), a minimum of 40% to IPs and 30% to STREPs;
- For outcome b) : 1-2 STREPS to be funded
- CSA: EUR 3 million

Call:

FP7-ICT-2013-11

7.9 Future and Emerging Technologies

Future and Emerging Technologies (FET) fosters exploratory research to open up new avenues across the full breadth of future information and communication technologies. It supports new and alternative ideas, concepts or paradigms of risky or non-conventional nature. FET aims to go beyond the conventional boundaries of ICT and ventures into uncharted areas, often inspired by and in close collaboration with other scientific disciplines.

Radical breakthroughs in ICT increasingly rely on deep synergies with other disciplines (for instance, biology, chemistry, nanoscience, neuro- and cognitive science, ethology, social science, economics) and with the arts and humanities. This requires new attitudes and novel collaborations between a broad diversity of actors in research. In this respect, FET is the home for transformative research that can lead not only to a range of exceptional and unprecedented outcomes in science and technology, but can also create new practices, paradigms and reshape disciplines.

FET Open scheme: challenging current thinking and attracting future potential

FET-Open is a **light, topic-agnostic and deadline free** scheme specifically designed to be open and continuously responsive to novel and fragile ideas that challenge current thinking, whenever they arise and wherever they come from. It aims at foundational breakthroughs that can open radically new directions for information and communication technologies in the future. FET-Open also aims to increase the role of young researchers and high-tech research intensive SMEs in its cooperative research to further enhance their disruptive innovation potential and to unlock longer-term scientific and industrial leadership.

Because of its foundational nature, FET research is especially well placed for **global collaboration**. This work programme provides opportunities to extend on-going FET projects²⁸ through new collaboration components (top up) involving the best researchers worldwide, so as to create global interest and raise the level of ambition around research avenues incepted within FET.

FET Proactive scheme: tackling targeted transformative research

FET Proactive supports foundational, high-risk research, supporting the design and development of emerging research avenues with the aim of creating novel areas and themes and bringing together emerging communities. In each of these high-risk and high-potential, innovative themes a number of projects are supported, in combination with community building actions that foster activities such as joint events, development of new curricula and research roadmaps. Such clusters of projects spearhead transformative research and enhance Europe's innovation potential around a number of fundamental long-term challenges in ICT, building towards new topics for industrial research agendas.

FET Flagship Initiatives

Complementing these two schemes, **FET Flagship Initiatives** are visionary, science-driven, goal-oriented, large-scale, multidisciplinary research initiatives nucleated from

²⁸ Ongoing projects selected under any of the FET objectives of the FP7 ICT Work programmes.

research on ICT future and emerging technologies. They are envisioned to be long term programmes on a scale much beyond existing initiatives. Activities in this work programme build on earlier actions and will enable the selection of two such initiatives in 2013.

FET Open scheme

Radically new ideas can come anytime, from anybody and from anywhere. FET-Open is specifically designed to be open and responsive to such fresh thinking. It aims to give promising but still fragile ideas the opportunity to mature into a credible and well-founded new direction of research.

What is common to all objectives under FET-Open is that they seek *proposals on radically new concepts and visions of the nature and use of information and information technologies, grounded in scientifically plausible and often interdisciplinary ideas on how to achieve them*. In spite of the high risk of failure, FET-Open projects can be the first step on the way towards future European scientific and industrial leadership in areas that today simply do not exist yet.

In this work programme, the FET-Open scheme features the following objectives:

- Objective ICT-2013.9.1: Challenging current Thinking
- Objective ICT-2013.9.2: High-Tech Research Intensive SMEs in FET research
- Objective ICT-2013.9.3: FET Young Explorers
- Objective ICT-2013.9.4: International cooperation on FET research
- Objective ICT-2013.9.5: FET-Open Xtrack

All these objectives are continuously open for submission. The FET-Open Objective ICT-2013.9.5 trials a new and lighter submission process, aims at a faster evaluation and a simpler project implementation. This pilot bridges to the implementation of the FET Open Scheme in Horizon2020, from 2014 onwards.

All FET-Open objectives call for STREPs²⁹, but with eligibility criteria that are specific to each objective. CSAs are accepted only under objective 2013.9.1. They are submitted directly as full proposals and are evaluated in one step.

Objective ICT-2013.9.1 Challenging current Thinking

Target Outcome

This objective supports the exploration of new and alternative ideas that, because of their risky or non-conventional nature, would not be supported elsewhere in the ICT Workprogramme. It seeks:

- foundational breakthroughs as crucial steps towards radically new forms and uses of information and information technologies within a clear long-term vision that is far beyond the state of the art;

²⁹ With the exception of Objective ICT-2013.9.4 on International cooperation on FET research.

- ambitious proof-of-concept and its supporting scientific foundation, where novelty comes from new, high-risk ideas rather than from the refinement of current ICT approaches;
- new inter-disciplinary collaborations, possibly with prominent and internationally recognized non-EU research teams where these can provide a significant added value.

This objective also supports Coordination and Support Actions for creating the best conditions within which FET research can flourish and achieve the transformative impacts that it aspires to. These activities may be, for example:

- actions, including networking and dissemination activities, aiming at the emergence of new research communities or collaborations involving a broad diversity of disciplines and actors into FET research;
- actions towards the increased active involvement of high-tech research intensive SMEs in exploratory research directions relevant to future ICT markets;
- actions that stimulate excellence and future leadership of pioneering teams of young researchers along new, exploratory research directions relevant to future ICT;
- actions aiming to strengthen the international dimension of FET.

Expected Impact

For STREP projects:

- opening new avenues of research towards future ICT that may be radically different from present day ICT;
- strengthening the future potential for high-risk / high-impact research and innovation;
- new research alliances in transformative research, exploiting synergies in the global science and technology scene for increased impact and excellence.

For CSA actions:

- catalyse transformative effects on the communities and practices for high-risk and high-impact research and on the mechanisms to support the global nature of such research;
- new, engaged and risk-taking research communities prepared to develop new and non-conventional approaches for addressing future challenges in science and society.

Funding schemes

STREP, CSA

Indicative budget distribution

EUR 34 million³⁰, out of which a maximum of EUR 3 million for CSA.

Call

FP7-ICT-2013-C³¹

³⁰ Indicative budget which is expected to be committed for successful proposals from the cut-off dates 25/09/2012 up to and including 12/03/2013 (batch 14 and batch 15).

Proposals are continuously receivable until 11 September 2012 (Short STREP) and 12 March 2013 (CSA). This objective applies a two-stage submission scheme and FET-Open specific eligibility and evaluation criteria (see Appendix 5 of this document).

Objective ICT-2013.9.2 High-Tech Research Intensive SMEs in FET research

Target outcomes

This objective fosters the driving participation of high-tech, research intensive SMEs in collaborative research projects targeting visionary, multi-disciplinary research. This will:

- link novel ideas, results or paradigms from science on the one hand, and marketable ideas on the other, that can lead to new, visionary and non-mainstream business opportunities and create future markets;
- generate a new scientific and technological asset base on which the SMEs can establish themselves firmly as future innovation players in areas with a high potential for future commercial or societal impact.

This objective does not seek short term commercial outcomes. It will therefore not support, for example, the incremental improvement of state-of-the-art technology, mainstream research aimed at short term product or service development, the incremental improvement of existing lines of business activity, research aimed to catch-up with the competition, developing foresights or market studies, or the mere development of new business models or business plans.

The consortium will contain at least one research intensive high-tech SME³² with an established and proven in-house research capacity and that will play a driving role in setting and executing the research agenda of the project. This objective is expected to be addressed by small STREPs proposals, each requesting a grant in the order of 1M€, where the largest shares of the resources are allocated to the participating SME(s).

Expected Impact

- Opening of new avenues of research towards future ICT that may be radically different from present day ICT;
- Secured and broadened in-house research capacity and research eco-system of the SMEs leading to sustainable future innovation potential;
- high-tech, research-intensive SMEs recognised as first-class players in FET research;
- increased visibility, exposure and impact of FET research.

Funding scheme: STREP

³¹ Note that a FET-Open Xtrack Call (STREPS only) opens right after the FET-Open continuous call closes. It uses a new and lighter submission process and aims at faster evaluation. See FET-Open Xtrack Objective ICT-2013.9.5.

³² An SME is an enterprise which has fewer than 250 employees, has an annual turnover not exceeding 50 million EUR, and/or has an annual balance-sheet total not exceeding 43 million EUR. Possible relationships with other enterprises must be taken into account when calculating these data of the enterprise. Research centres, research institutes, contract research organisations or consultancy firms are not eligible SMEs for the purpose of the Co-operative and Collective schemes.

Indicative budget distribution: EUR 6 million³³

Call: FP7-ICT-2013-C

Proposals are continuously receivable until 11 September 2012. This objective applies a two-stage submission scheme and FET-Open specific eligibility and evaluation criteria (see Appendix 5 of this document).

Objective ICT-2013.9.3 FET Young Explorers

Target outcomes

This objective aims at capturing the creative potential of young researchers by fostering their leadership and participation in collaborative research projects targeting first-ever and exploratory, multi-disciplinary research.

This exploration should be grounded in scientifically plausible ideas that can provide a novel basis for the development of radically new concepts and visions that extend the conventional boundaries of ICT. New multi-disciplinary approaches and unconventional methodologies are encouraged.

This objective is expected to be addressed by small STREP proposals, each requesting a grant in the order of 1M€. A project must be led by a young researcher, and the leadership by young researchers of all work packages is also required. No more than six years should have elapsed between the award of a Ph.D. (or equivalent) for each such young researcher and the date of submission of the short proposal.³⁴

Expected Impact

- opening of new avenues of research towards future ICT that may be radically different from present day ICT;
- empowered next generation of European science and technology leaders through their increased leadership of collaborative ICT research;
- contribution to early independence of young high potential researchers.

Funding scheme: STREP

Indicative budget: EUR 8 million³⁵

Call: FP7-ICT-2013-C

³³ Indicative budget which is expected to be committed for successful proposals from the cut-off dates 25/09/2012 up to and including 12/03/2013 (batch 14 and batch 15).

³⁴ Proof must be submitted at step 2 of the evaluation, together with the full proposal. Extensions of this period may be allowed only in case of eligible career breaks which must be properly documented: maternity (18 months per child born after the PhD award) & paternity leave (accumulation of actual time off for children born after the PhD award) and leave taken for long-term illness, national service.

³⁵ Indicative budget which is expected to be committed for successful proposals from the cut-off dates 25/09/2012 up to and including 12/03/2013 (batch 14 and batch 15).

Proposals are continuously receivable until 11 September 2012. This objective applies a two-stage submission scheme and specific eligibility and evaluation criteria (see Appendix 5 of this document).

Objective ICT-2013.9.4 International cooperation on FET research

Target outcomes

This objective aims to increase and accelerate the impact of FET research projects by cooperating with non-EU partners of excellent global standing. It targets the extension of ongoing FET³⁶ projects with complementary research activities in which collaboration with non-EU research partners brings significant added value.

The research content is expected to focus on new activities that expand the research challenges and reinforce the impact of the ongoing project. The outcome of that research is expected to be made freely and openly available for the benefit of the research community.

Funding can be requested by the partners from the ongoing FET project and by the new non-EU research participant(s) to cover the coordination and joint research activities necessary to complement the ongoing project. At least 50% of the requested funding should be allocated to the new non-EU research participant(s)³⁷.

Expected Impact

- enhanced outcomes, global reach and impact of ongoing FET research projects through research collaboration with non-EU participants with complementary expertise;
- reinforced research cooperation between world-class EU and non-EU researcher teams facilitating the emergence of global alliances.

Funding scheme: Additional funding to existing grant for on-going FET³⁸ IP and STREP projects ending at least 18 months after the submission date of the proposal.

Indicative budget distribution: EUR 2 million³⁹

Call: FP7-ICT-2013-C

Proposals are continuously receivable until 12 March 2013. This objective applies a one-stage submission scheme and specific eligibility and evaluation criteria (see Appendix 5 of this document).

Objective ICT-2013.9.5 FET-Open Xtrack

Target Outcome

³⁶ Ongoing projects selected under any of the FET objectives of the FP7 ICT Workprogramme.

³⁷ This restriction is obligatory for proposals submitted in batch 15.

³⁸ Ongoing projects selected under any of the FET objectives of the FP7 ICT Workprogrammes.

³⁹ Indicative budget which is expected to be committed for successful proposals from the cut-off dates 25/09/2012 up to and including 12/03/2013 (batch 14 and batch 15).

This objective supports the exploration of new and alternative ideas that, because of their risky or non-conventional nature, would not be supported elsewhere in the ICT Workprogramme. It seeks:

- foundational breakthroughs as crucial steps towards radically new forms and uses of information and information technologies within a clear long-term vision that is far beyond the state of the art;
- ambitious proof-of-concept and its supporting scientific foundation, where novelty comes from new, high-risk ideas rather than from the refinement of current ICT approaches;
- new inter-disciplinary collaborations, possibly with prominent and internationally recognized non-EU research teams where these can provide a significant added value.

Expected Impact

- opening new avenues of research towards future ICT that may be radically different from present day ICT.

Funding schemes

STREP

Indicative budget distribution

EUR 15 million

Call: FP7-ICT-2013-X

This objective trials a new and lighter submission process, aims at a faster evaluation and a simpler project implementation. It applies a one-stage submission scheme and specific eligibility and evaluation criteria (see Appendix 5 of this document).

FET Proactive

FET Proactive provides support to promising domains where critical mass needs to be built up in to achieve impacts on science, technology, economy and society. This work programme sets out two Proactive Initiatives in key areas in which FET aims to spearhead transformative research, using living organisms and physical phenomena at the atomic scale as inspirations for new ICT.

Long term FET-like research on "Symbiosis between humans and computers" and "Creative ICT" will be addressed under Objective ICT-2013.2.1 (see entry c) and Objective ICT-2013.8.1 (see entry c).

FET Proactive Initiatives apply specific eligibility and evaluation criteria (see Appendix 5).

Objective ICT-2013.9.6 FET Proactive: Evolving Living Technologies (EVLIT)

Computational and self-adapting properties of living organisms are superior to recent ICT technology in many ways. Being composed of physically and chemically embodied entities, where function is associated to physical structure, they show

properties such as scalability, self-reproduction, self-construction, evolvability, self-organization, adaptability and robustness. Learning to build future ICT along these lines offers a promising way to address important issues such as design complexity of ICT systems, difficulty and specificity of manufacturing, energy management, etc.

The objective is to create living technologies using the principles of biological evolution that co-organize information and matter in systems of physical entities. This includes the full range of possible methodologies, such as using living technologies built up with nano-mechatronics, biological information encoding principles, bio-inspired artificial systems or bio-hybrid systems.

Target outcomes

- Empirical, theoretical and synthetic approaches that define the key bio-inspired principles that can drive future living technologies and the environment to use them in a controlled way.
- Significant steps towards embodying these key principles and showing their usefulness in a technological context.

Expected impact

- Foundations, approaches and proofs of concept for a radically new type of living technology.
- Possible contributions beyond the area of ICT (manufacturing, chemistry, biology, agriculture).

Funding schemes

STREP

Indicative budget distribution

EUR 16 million

Call

FP7-ICT-2013-10

Objective ICT-2013.9.7 FET Proactive: Atomic and Molecular Scale Devices and Systems

The research targets the physical access and greater understanding of the behaviour of a single atom or molecule, or small ensembles thereof, as elementary functional resources for future ICT systems. Aspects such as new forms of atomic scale constructs and fabrication processes, control, sensing and picometer interconnection precision of components are addressed in this objective.

Target outcome

- a) Investigation, Design, and Demonstration of ICT functionality, at the atomic and molecular scale, through various physical implementations. Working components and systems relying on robust atomic scale fabrication technologies should be targeted.
- b) Investigation, Design, and Development of metrology and control systems at the atomic scale for molecular references or precision sensors or procedures to preserve operation integrity.

c) Design and Development of simulation and hierarchical modelling tools (from ab initio to large atomic scale systems, and single device to circuit and system level), taking account time dependencies to explore the response time of the proposed architecture.

d) Investigation, Design and Demonstration of the embedding and interfacing of atomic and molecular scale components with a mesoscopic technological and material environment, considering charge and non-charge transport, physical nano-connectivity and atomic-scale mechanical response.

Integrated Projects should cover at least topics a), c), and d). STREPs should cover at least two of the above topics.

Expected impact

- Opening of disruptive avenues and exploration of new possibilities for components and technologies at the atomic and molecular scale
- Experimental demonstration of principle, tangible realization, and feasibility of such components and systems
- New perspectives on potential applications with concrete advantages (e.g. energy consumption, data and operation integrity, clock frequency, ...)

Funding schemes

IP, STREP

Indicative budget distribution

EUR 16 million

Call

FP7-ICT-2013-10

Objective ICT-2013.9.8 Coordinating communities, identifying new research topics for FET Proactive initiatives and fostering interdisciplinary dialogue:

Target Outcome

- a) Short duration actions (typically 6-12 Months) to organise consultations of multi-disciplinary communities to formulate novel FET research topics, focussing on new emerging research areas for H2020 related to ICT and beyond. The main objective should be to identify new research avenues from a global perspective, the associated fundamental challenges, and to analyse the expected impact on science, technology and society.
- b) Actions supporting the coordination and cooperation of the targeted research communities, fostering the consolidation of research agendas, assessing the impact and proposing measures to increase the visibility of specific topics to the scientific community, to targeted industries and to the public at large.
- c) Actions supporting and promoting cooperation with non-EU research teams in foundational research on FET topics, with a balanced participation from partners in the EU and from target countries.

- d) Actions to organise conferences and workshops which should foster dialogue between science, policy and society on the role and challenges of interdisciplinary long-term research, increasing Europe's creativity and innovation base and bridging diverse European research communities and disciplines.

Expected impact

- Novel, widely supported research topics to be considered as inputs for future FET work programmes.
- Reinforced coordination of research projects in FET Proactive Initiatives in current or previous calls.
- Strengthened research excellence and co-operation with partners from outside Europe.
- Early identification and increased awareness of new trends emerging on a global scale in support of future proactive initiatives
- Increased visibility of the FET community and links between European research communities

Funding Scheme

CSA

Indicative budget distribution

EUR 3 million

Calls

FP7-ICT-2013-10

FET Flagships

FET Flagships are science-driven, large-scale, multidisciplinary research initiatives oriented towards a unifying goal, with a transformational impact on science and technology and substantial benefits for European competitiveness and society. The goals of such initiatives should be visionary and highly ambitious in terms of scientific challenges, resources required and coordinated efforts. They require cooperation among a range of disciplines, communities and programmes, extending over a long period (in the order of 10 years duration). FET Flagships are based on partnerships that enable effective coordination of efforts.

An earlier call in 2010 (FP7-ICT-FET-F) has identified six potential flagship topics which have been elaborated in a preparatory phase by a number of EU-funded coordination actions, referred to as "FET-Flagships Preparatory Actions". As a next step, the ramp-up phase, this Work Programme calls for proposals to initiate and build up two FET Flagships.

Objective ICT-2013.9.9: FET Flagships

Proposals should address a grand scientific challenge and need to provide a common research roadmap with well-defined goals and ambitious but realistic milestones. Proposals should be justified in terms of expected scientific advance, potential technological breakthroughs and socio-economic impact. Proposals should describe

how the relevant disciplines, stakeholders and resources will be brought together and be efficiently coordinated under strong scientific leadership.

Target outcome:

Two FET Flagships, each one addressing a topic in line with the FET Flagship Preparatory Actions. These actions organised extensive consultations with the relevant scientific communities and identified relevant national/regional initiatives and programmes that could be part of such a common European effort:

The topics of the Preparatory Actions are:

- understanding and managing complex, global, socially interactive systems, with a focus on sustainability and resilience - stemming from the work of FUTURICT;
- exploiting properties of graphene and related two-dimensional materials for the emergence of a graphene-based translational technology and innovative applications - stemming from the work of GRAPHENE;
- smart, energy-efficient devices for personal assistance based on zero-power sensing, computation and communication technologies - stemming from the work of Guardian Angels;
- building a European facility to simulate the working of the human brain by developing and using supercomputers and neuromorphic hardware, and involving the collection and integration of large amounts of medical and neurophysiological information - stemming from the work of HBP;
- building individual computational models of the biological processes that occur in every human for personalised healthcare - stemming from the work of ITFOM;
- unveiling the secrets underlying the embodied perception, cognition, and emotion of natural sentient systems and using this knowledge to build robot companions based on simplicity, morphological computation and sentience - stemming from the work of RoboCom.

Recognizing that FET Flagships are large endeavours that require a common European effort at multiple levels, this Work Programme calls for:

a) Proposals for CP-CSA with a duration of 30 months. They should describe core research tasks, based on the common research roadmap, as well as establishing a contractual framework for collaboration with other projects and initiatives that address research priorities within the same roadmap. This framework needs to ensure a proper coordination and integration of all the research activities that contribute to the FET Flagship both within the CP-CSA project and within other research activities. The governance to be put into place needs to ensure broad participation and effective opportunities for new partners to join.

Proposals should reserve a substantial part of the budget (e.g. 20%) for future partners, foreseeing an enlargement of the consortium in order to create flexibility and openness, and to ensure dynamic responses to unforeseen challenges.

CP-CSA projects will undergo a review after 18 months to assess their contribution to FET-Flagship strategic objectives and their implementation progress.

b) An ERA-NET between national and/or regional funding agencies aiming at supporting the FET Flagships⁴⁰. Proposals for an ERA-NET should describe how they will coordinate national and/or regional efforts with the common research roadmap.

Expected Impact

a) Expected impact of CP-CSA:

- transformational impact on science and technology and substantial benefits for the European economy and society;
- European leadership in key scientific areas;
- strengthening of the interfaces between ICT and other disciplines;
- progress towards the realisation of the fully operational phase of the FET Flagship, following the ramp-up phase.

b) Expected impact of ERANET:

- enhanced complementarities and synergies of regional, national, European and international research programmes and initiatives
- networking between national funding agencies and creation of a discussion forum for matters of interest related to the two FET Flagships
- identification of areas that could complement the CP-CSA and that may be subject of future joint calls
- reduction of the fragmentation of the European Research Area (ERA)

Funding schemes

a): CP-CSA

b): CSA

Indicative budget distribution:

- CP-CSA: EUR 108 million

- ERANET: EUR 2 million

Calls

a): FP7-ICT-2013-FET-F

b): FP7-ICT-2013-11

⁴⁰ The closing date for the ERA-NET Call is deferred in time as compared to the CP-CSA Call.

7.10 International Cooperation

Objective ICT-2013.10.1 EU-Japan research and development Cooperation

a) Optical Communications

Target outcome

The activity intends to focus on the Ethernet ecosystem in conjunction with all-optical networks targeting capacities of 100 Gbit/s per wavelength. While components targeting 100 Gbit/s, and also networks are under development and trial, this activity will focus on further enhancement on a system level of the future Ethernet transport networks by advancing the technologies to efficiently incorporate all network layers, to achieve high-rate server connectivity, and reliable and efficient network access and core switching. Developments of components if needed are to be integrated into an overall system view. Specific target is as follows:

- to achieve efficient and reliable Ethernet transport at 100 Gbit/s rates using single mode- or multi mode fibre for enhanced capacities in short and long range all-optical networks.
- to prove, and if needed, contribute to further advancement of standards such as IEEE802.3ba, ITU-T G.709, and OIF Implementation Agreement.

Expected Impact

- Efficient high rate Ethernet transport and standardisation spin off.
- Key enabling technologies for the future generations of high-speed all-optical networks with improved economic, spectral and energy efficiency.
- Joint EU-Japan contribution to standardization bodies and fora.

b) Wireless Communications

Target Outcome

The goal is to develop short-range wireless systems using millimetre-wave and terahertz-wave technologies to realise ultra high data transmission capacities and high resolution sensing inside or outside of buildings. The focus will be on architectures towards ultra-high speed short-range wireless technology, radio transmission technology, terahertz-wave base band and millimetre-wave radio access technologies including spectrum re-use and cognitive technologies. It includes:

- The use of millimetre bands, both in the context of in-door, in-house applications and the possibility to look for use in outdoor applications like sensing or fibre extensions.
- Achievement of short-range wireless transmission and networking in the terahertz frequency bands.
- A roadmap towards a possible common standardisation in future high-capacity short-range technologies and sensing technologies.

Expected Impact

- Better exploitation of new spectrum parts for short range, very high capacity communication and high resolution sensing applications.
- Key enabling technologies for the future generations of short-range wireless systems with improved economic, spectral and energy efficiency.
- Joint identification of standardization requirements and contribution to standardization bodies and fora

c) Cybersecurity for improved resilience against cyber threats

Target outcome

This activity focuses on research on cybersecurity for improved resilience against cyber threats, such as leak of information, denial of service, malware among EU and Japan. It will develop technologies and strategies for improving and enhancing cybersecurity in heterogeneous networked, service and computing environments and facilitate the early identification of cyber attacks.

The goal is to collaboratively develop a demonstrable and state-of-the-art prototype to improve and enhance cybersecurity against existing and emerging cyber threats in Europe and Japan.

This approach may require additional research and technical development in the field of system and fundamental security, such privacy protection, database security, secure software development, fundamental security technologies based on cryptographic methods and protocols for cloud security, smart-phone security and future network security.

Expected impacts

- Established international critical mass to develop new approaches and instruments in the fight against emerging cyber threats.
- Reinforced policy coordination between the EU and Japan as well as other potential international partners.

d) Extending the cloud paradigm to the Internet of Things - Connected objects and sensor clouds within the service perspective

Target outcome

Current cloud technology lacks features for secure and flexible services that make use of distributed sensing devices and a high quantity of object instances.

The research should focus on the combination of Cloud and Internet of Things (IoT) technologies and to investigate the development of cloud-based service platforms taking into account the IoT perspectives on massive data storage and communication needs in the cloud for the execution of real-time services. The scope may include architecture, middleware and services. The research goals are as follows

- Sound demonstration on how the Internet of Things concept can be enriched and completed by the Cloud paradigm and approach (on sensor, infrastructure, middleware and applications towards end-users level).
- Establishment of a scalable and flexible service platform architecture for enabling secure and smart, partly virtualised, services with processing, integrating, and visualizing contents combined with ambient real life information.
- Additional focus on an Internet of Things-Cloud reference test facilities for ensuring global interoperability for connectivity, services and privacy by design / trusted solutions.
- Concentration on the Smart Cities perspective with a) a business context (business process improvements and industrial applications) and b) societal context (social and environmental applications).
- Road-mapping and recommendations for further activities in the combination of Internet of Things and Cloud.
- Technology for enabling realtime secure communication services with connecting trillions objects and cloud service users

Expected Impact

- Development of integrated Cloud & IoT approaches in terms of architecture, middleware and services within a Smart Cities context.
- Harmonisation of international standardisation efforts and sharing of best practices.

e) Global scale experiments over federated testbeds: Control, tools and applications

Target outcome

The goal is to enable experiments across testbeds as a framework for understanding the management of heterogeneous resources, the access to these resources and the evaluation of their usage. It requires software solutions that are suited to control and deploy an experiment, using distributed resources of various testbeds, possibly wired and wireless. Defining APIs, a thin convergence layer for accessing testbeds seamlessly and a monitoring framework is the focus of this activity. Solutions will be demonstrated for various scenarios ranging from wireless testing to Information-Centric networking.

Research focuses on software defined networking (SDN) paradigm which enables parallel deployment of slices assigned to virtual network providers. The slicing can be done on physical or virtual infrastructures, implying multiple levels of virtualization. Proofs of concept for the benefit of network virtualization can be seen in content-centric networks, or other “beyond-IP” networks.

The activity should produce a demonstration of the relevance of the proposed solutions in a heterogeneous environment. It will cover the control plane (for authentication and resource reservation), the experimental plane for setting up the scenario and monitoring it over the lifetime of the experiment, as well as collecting the appropriate measures. A target environment should be used as a common framework, including wireless and Information-Centric networks.

The software developed in the research projects targets deployment and evaluation in the available testing facilities on both sides (OFELIA, OpenLab, JGN-X).

An integration of SDN with processing capabilities available in Data Centers will bring processing closer to the data it is applied to, improving data access and minimizing transit traffic in the network.

The solutions should then be disseminated for a large adoption, eventually going beyond the testbed framework if appropriate.

Expected Impact

- Interoperability of distributed resources for experiments across heterogeneous testbeds.

f) Green & content centric networks

Target outcome

The focus is on a change in network architecture from host-oriented to content-centric networking⁴¹ The content-centric networking seeks to adapt the network architecture to current network usage patterns. This new paradigm can open new possibilities for energy-efficient content distribution. Of particular importance are issues related to naming, addressing and routing as well as resource control, access analysis and Digital Rights Management. The research needs also to address the migration perspective from the current Internet protocols and architecture.

Green contents distribution platform is addressed from the point of view of integration with power consumption information gathering framework on lower layer network and higher layer network controlling framework that enables optimization of contents location and routing. The content-centric networking seeks to adapt the network architecture to current network usage patterns. This new paradigm can open new possibilities for energy-efficient content distribution.

The call targets a theoretical analysis as well as prototyping and standardisation activities to ensure that the joint work will have an impact on the global green content centric networks landscape. It includes an architectural framework and the related performance assessment framework. Migration technology from current Internet and low energy technology for realizing contents centric networking are included as well. Results may be channelled towards the relevant standardisation fora.

Expected Impact

- Content centric networking architecture for low energy efficient content delivery and associated standardisation requirements

Expected Impact, in addition to specific impacts, for a), b), c), d), e) and f)

Collaborative targeted research and prototyping enable deepened and continued collaboration between European and Japanese researchers and industry, towards the creation of sustainable research links benefiting researchers and industry competitiveness of both sides.

Funding Schemes

⁴¹ content-centric networking is also referred to as information centric networking in some FP7 projects and Data Aware Networking in ITU-T

One STREP per topic a) to f) above.

Indicative budget distribution

EUR 9 million total

Call: FP7-ICT-2013-EU-Japan

Objective ICT-2013.10.2 EU-Brazil research and development Cooperation

a) Cloud Computing for Science

Target outcome

The targeted output is the development of state-of-the-art Cloud Computing environment that efficiently exploits the computational, communication and data resources in both the EU and Brazil and offers interoperable and user-centred interfaces. Proposed R&D in this topic would target:

- Infrastructure technologies that promote sustainability, including virtualization of distributed resources (conventional or not), low-power and low-cost solutions, federation of existing, heterogeneous e-Infrastructures in the EU and Brazil.
- Support platforms for e-Science applications, including well-defined APIs and underlying mechanisms for services such as composition, execution and management of large workflows, management and protection of huge datasets.
- Software engineering techniques for the provisioning of e-Science applications as efficient and user-friendly services, including rapid development and deployment of scientific gateways, highly scalable parallel and distributed programming models.
- Crosscutting issues such as the alignment and involvement with international standardization efforts, the commitment with industrial involvement at the early stages, and a close collaboration with the end users.

Expected impact

Applications benefitting from this environment could have a direct impact in a number of fields such as health care, water management, climate change mitigation, natural resources management and an indirect impact in poverty reduction. Actions on this topic will increase efficiency in the usage of expertise and e-Infrastructures that exploit the computational, communication and data resources existing on both sides of the Atlantic.

To add, several IT fields could be impacted depending on the exact scope of the proposals, e.g., virtualization, software engineering, management of large workflows, management and protection of huge datasets. This topic may have an impact in international standardization efforts (e.g. common APIs) while guaranteeing industrial involvement and focus on user community needs.

b) Sustainable technologies for a Smarter Society

Target outcome

This activity is expected to exploit the underlying technologies, components and systems that are needed for the deployment of sustainable ICT solutions (e.g. green ICT, smart things, complex and control systems, nano-electronics, micro-systems).

Advancement of the required technologies, in particular systems development platforms, that enable the development of sustainable complex systems that are cost effective, energy

friendly, affordable and based on open standards, to address current societal challenges for better living.

The purpose is to obtain a systems development platform, composed of modules that will take into account different criticalities of the target systems (time-critical, safety critical, etc) as well as its energy consumption.

Priority will be given to projects that integrate and/or reuse existing components while addressing the research and innovation addressed above, and that demonstrate the final platform in a particular application area, for example energy-efficient buildings (including metering and energy management), transport and traffic management systems, smart grids, smart systems for safety control of the food or water supply chain, environment monitoring and control, etc.

Expected impact

Applications benefitting from these systems development platforms are expected to have a direct impact in a number of fields such as:

- electricity, water and other natural resources management;
- communications and transport;
- education and health;
- climate change mitigation

They should enable to design, model and operate systems composed of a large number of independent, autonomous, heterogeneous and interacting (sub)systems as well as to monitor and control their potential emergent behaviours in a systems-of-systems engineering perspective.

This topic may as well have an impact in international standardization efforts and sharing of best practices.

c) Smart services and applications for a Smarter Society

Target outcome

The focus will be on designing, building and deploying interoperable infrastructures, open platforms and scalable solutions exploiting new trends in Future Internet experimentation and open data. One of the key challenges will be to explore data "mash up" processes which synthesizes new information by collecting, connecting, reusing, combining and semantically aggregating disjoint information extracted from a plethora of sources, such as information generated by users (e.g. through social networks), captured from sensors or made available by public authorities (e.g. GIS, traffic). The adoption of a user-centred innovation approach, emphasising trust and privacy aspects is therefore required.

To develop smart, open experimental platforms to enhance the quality-of-experience of urban living (in terms namely of citizen involvement, inclusion, sustainable lifestyles, etc.). The federation of experimental platforms will be encouraged where appropriate, in particular through the use of standards, open software and open data.

To support the deployment of interoperable wireless infrastructures exploiting new trends on Future Internet and open data (namely from sensors and social networks) to create context-aware services and applications of relevance to citizens in areas such as directing and informing large crowds, emergency and crisis management, smart mobility, energy efficiency, etc., especially on the occasion of large-scale events.

Expected impact

The joint EU-Brazilian components will be crucial to foster critical mass to develop new standards and markets driven by Future Internet facilities. Both European and Brazilian industry will benefit from, and contribute to, its growth.

Bringing together relevant context data and already validated experimental facilities under the concept of smart wireless platforms will have a clear impact and direct benefit in light of the upcoming Football World Cup and Olympic Games to be held in Brazil.

This collaboration will also allow comparing and exchanging best practices on the contribution of ICT to societal and sustainability targets, including that of standards on the minimum quality guarantees of the shared data.

d) Hybrid broadcast-broadband TV applications and services

Target outcome

Hybrid broadcast-broadband TV applications and services to address a new generation of TV applications taking advantage of the widespread Internet connectivity will be developed, both for commercial use and for educational or other public goals.

Although the TV broadcast transmission standards are different in Brazil and Europe, there is an opportunity to foster the development of intuitive and attractive new services seamlessly connecting broadcast and broadband while enabling new business models.

A key issue is how to develop and author applications which can run on different devices / software platforms. Further relevant aspects are: synchronisation of content from different A/V sources running on different distributed types of devices. Intelligent search and navigation mechanisms, identity management, trust and security as well as hyperlinking of video content, especially for social TV applications are among the key functionalities required for an advanced hybrid media experience.

Expected impact

1. Enhance the competitiveness of the EU and Brazilian industry, including innovative SMEs, web apps and TV apps developers.
2. Allow application developers to market their services and applications worldwide, independently of the terrestrial Digital TV standard used.
3. The development of intuitive and attractive services, seamlessly connecting broadcast and broadband is expected to enable new business models.

Funding Schemes

Small or medium scale focused research projects (STREPs).

Proposals will only be selected on the condition that their corresponding coordinated project will be funded by the Brazilian Authorities.

Indicative budget distribution

STREP: EUR 5 million

Up to one proposal per topic may be funded under this call: That is one proposal for each one of the four topics implemented via STREPs

Call:

FP7-ICT-2013-EU-Brazil

Objective ICT-2013.10.3 International partnership building and support to dialogues – Horizontal International Cooperation Actions

Target outcomes

The target is to support dialogues between the European Commission/the EU and strategic partner countries and regions, and to foster cooperation with strategic third country organisations in collaborative ICT R&D both within the EU's Framework Programmes (FP7, Horizon 2020) and under relevant third country programmes. This could include in particular:

- the organisation of events synchronised with dialogue meetings⁴², providing timely input and follow-up for example on common R&D priorities and future cooperation opportunities, assisting in focusing dialogue meetings as well as increasing their visibility.
- strengthening of cooperative research links through the set-up of sustainable cooperative mechanisms or platforms between European organisations and relevant leading third country organisations, with the aim of establishing mutually beneficial partnerships based on synergies to be identified between the Digital Agenda for Europe's (DAE) international agenda and third countries/regions' ICT strategies,
- reinforcement of industrial cooperation on ICT research and development, notably through a better networking between European ICT Technology Platforms and relevant associations in third countries,
- increased co-ordination at EU level with horizontal Framework Programme instruments to promote international cooperation (such as BILAT, INCO-NET and ERA-NET), as well as relevant EU Member State and Associated Countries programmes.

Proposals should build upon the achievements by similar past or ongoing projects, in countries/or regions where applicable, while avoiding duplication of that effort in this Call.

Targeted countries/regions:

- a) ACP countries (in particular Africa)
- b) Asia (in particular China, India, South-East Asia)
- c) Eastern Europe and Central Asia
- d) High Income Countries: Subgroup 1: North America (Canada, USA)
- e) High Income Countries: Subgroup 2: East Asia/Oceania (Australia, Japan, Korea, New Zealand, Singapore, Taiwan)
- f) Latin America
- g) Mediterranean Partner Countries

It is expected that each targeted area will be covered by at least one project, and that duplication of effort in an area is avoided (i.e., if more than one proposal / area should be retained, preference will be given to proposals with different and/or additional country(ies) coverage).

⁴² This includes Information Society Dialogues (organised by DG INFSO), meetings under S&T Agreements (organised by DG RTD), and other relevant meetings (e.g. Senior Officials or Ministerial level regional meetings).

Expected impact

- Reinforcement of strategic partnerships with key third countries and regions in areas of mutual interest and added value in jointly addressing important issues.
- Increased visibility for EU ICT R&D activities and research excellence.
- Support provided for European organisations/individuals in accessing third country programmes.

Activities under this objective should be covered in balanced partnership with relevant and highly qualified third country organisations, including in particular governmental actors (third country research ministries/agencies), relevant industry associations, and academic partners (research centres/universities). Measureable performance indicators should be included (e.g. minimum numbers of events to be organised, participants, new proposals assisted/helped to initiate, European organisations/individuals supported in accessing third country programmes, etc.).

Funding schemes

CSA (Support Actions)

Indicative budget distribution

- CSA (SA): EUR 8 million (maximum EU grant of EUR 800 K per proposal)

Call

FP7-ICT-2013-10

7.11 Horizontal Actions

Objective ICT-2013.11.1 Ensuring more efficient, higher quality public services through Pre-Commercial Procurement of ICT solutions across sectors of public interest

The aim of this action is to bring radical improvements to the quality and efficiency of public services by supporting the development and validation of breakthrough solutions through Pre-Commercial Procurement⁴³ (PCP). It is open to proposals in all areas of public sector interest, (e.g. for new ICT solutions in healthcare, inclusion, e-government, transport, energy, environment), in complementarity with actions foreseen under other objectives. Especially where interoperability and coherence of solutions across borders is required, cross-border cooperation between public purchasers can help better address issues of common European interest.

The minimum number of participants is three independent legal entities which are public purchasers. Each of these must be established in a different Member State or associated country. Public purchasers are contracting authorities in the meaning of the public procurement Directives⁴⁴ at all levels (local, regional, national and supra-national) that are responsible for the acquisition strategy of the new solutions that could be developed as a result of the PCP undertaken during the action to obtain the required quality and efficiency improvements in their public service offering⁴⁵. Other stakeholders in the public service delivery chain may participate in addition, if their participation is well justified and adds value to the action⁴⁶.

Target outcome

Each action focuses on one jointly identified concrete challenge in the mid-to-long term innovation plans of the participating public purchasers that requires new R&D, which is proposed to be procured in cooperation through PCP. Consortia shall demonstrate that they contain a critical mass of public purchasers- with clear financial commitments for jointly undertaking the cross-border PCP – that can trigger wide implementation of the public service innovation strategies and solutions that will be developed during the PCP. In order to have a lasting impact, the co-operation developed during the actions should also provide reliable indications that it could continue beyond the EU funding.

The EU contribution for the action shall take the form of a CP-CSA grant that will combine the reimbursement of eligible costs for the activities linked to the preparation, management and coordination of the joint PCP (activities under the CSA part of the action) plus a reimbursement of maximum 75% of costs for the development of the new ICT solutions procured through the joint PCP (for activities under CP part of the action).

The activities covered by each action will combine, in a closely co-ordinated manner:

(1) Under the CSA part of the action: Networking and coordination activities, in particular activities related to preparation, management and coordination of the joint cross-border PCP undertaken under the CP part of the action, such as:

- Defining together the mid-to-long term solutions requirements for the innovation of public services, and resulting specifications for a joint PCP call for tender

⁴³ See COM(2007)799 and SEC(2007)1668.

⁴⁴ 2004/18/EC and 2004/17/EC

⁴⁵ Examples of public purchasers can include public hospitals, public transport operators, relevant ministries (such as for health, welfare, transport, environment, justice, etc), water or energy utilities, communes, police or fire brigades, etc

⁴⁶ Examples of "other stakeholders" that can help a consortium of e.g. national/regional public healthcare institutes and public hospital procurers collect the solution requirements of the entire health service delivery chain: private hospitals, health insurance organisations, doctors

- Establishing implementation methods for Multinational PCP evaluation and monitoring
- Cooperation agreements enabling further trans-national PCP projects or programmes
- Awareness raising, experience sharing (including PCP training for public purchasers), dissemination of results and contribution to standardisation bodies or regulations to remove obstacles for introduction of PCP innovations into the market

(2) Under the CP part of the action: Joint research activities related to validating the PCP strategy jointly defined by the public purchasers participating in the action, through:

- Exploration, through a joint PCP, of possible alternative solution paths from a number of suppliers for the targeted improvements in public sector services, and
- Testing of these solutions against a set of jointly defined performance criteria, based on a well-defined public purchasing need that is jointly defined by the public purchasers undertaking the joint cross-border PCP.

Actions shall cover the full PCP life cycle of solution design, prototyping, and original development of a limited volume of products/services in the form of a test series.

The joint cross-border PCP involves the award of PCP contracts to a number of tenderers selected through a joint PCP call for tender organised during the action. Different constellations for joint procurement⁴⁷ are allowed (see Appendix 6). A common mechanism, including a common set of selection/award criteria, for evaluating the offers submitted to the joint PCP call for tender shall be foreseen. Detailed rules for companies to participate in the financed projects shall be defined by the public purchasers. The call organisers shall organise the PCP while respecting the Treaty principles, the competition rules and the specific requirements in Appendix 6.

Expected Impact

- More forward-looking, concerted, public sector approach to societal challenges
- Cooperation between stakeholders across public sector departmental boundaries to develop common answers to societal challenges faced by the public sector across a number of EU Member or Associated States
- Reduced fragmentation of public sector demand by enabling public purchasers to collectively implement PCP strategies in areas, which due to their nature are better addressed jointly, or which they would not have been able to tackle independently.
- Increased opportunities for wide market uptake and economies of scale for the supply side by forming critical mass on the public demand side, wide publication of results of cross border PCP activities and contribution to standardisation of jointly defined public sector PCP solution requirements specifications.

Funding Scheme

1 CP-CSA for PCP

Indicative budget distribution

EUR 4 million, of which maximum 30% for the CSA part of the CP-CSA

Call

FP7-ICT-2013-10

⁴⁷ "Joint procurement" means combining procurement actions of two or more contracting authorities into one procurement carried out jointly. The defining characteristic for this action is that there should be only one tender published, and one entity awarding the resulting R&D service contracts for all PCP phases, on behalf of all participating contracting authorities.

Objective ICT-2013.11.2 More efficient and affordable solutions for digital preservation developed and validated against public sector needs through joint Pre-Commercial Procurement (PCP)

Target outcome

Continuous technology change has turned the mandate to preserve digital resources into a constantly evolving challenge for public organisations, such as administrations and memory institutions. It requires innovative, ready-to-use, customisable and affordable technical solutions and new skills in curatorial staff.

Projects should involve all key stakeholders, i.e. public digital collection holders as well as industrial preservation technology and service providers, for carrying out R&D work that responds to well-defined needs shared by the public organisations in Europe.

Technology solutions could cover areas such as preservation-relevant metadata, migration, the preservation of particularly challenging types of digital objects, and others. Work could include establishing and implementing best practices, preservation planning, and staff training; integrating digital preservation requirements in existing information systems; and increasing those systems' resiliency against technological changes. Solutions should be tested against a set of functionality / performance criteria, jointly defined by the potential public purchasers undertaking the joint cross-border pre-commercial procurement.

Use of open platforms and contribution to standards is encouraged. PCPs shall be implemented according to the conditions outlined in objective 11.1 and Appendix 6.

Expected impact

- Reduced preservation costs and improved preservation capacity and competences in public organisations dealing with digital preservation, including small archives.
- Strengthened position of European service and technology providers (including SMEs) in the field of digital preservation

Funding Schemes

1-2 CP-CSA for PCP

Indicative budget distribution

EUR 5 million, whereas a maximum of 30% of the funding of a project can be used for the CSA part

Call

FP7-ICT-2013-11

Objective ICT-2013.11.3 High quality cloud computing environment for public sector needs, validated through a joint pre-commercial procurement (PCP)

Target outcome

This action targets the harmonisation of requirements and the implementation of a joint strategy for cloud computing in the European public sector. As public sector bodies at national and European level could equally benefit from the transition towards cloud computing, the implementation of this action is foreseen in the form of a CP-CSA for PCP

undertaken by the public sector bodies in Member States and associated countries. The PCP shall be organised while respecting the Treaty principles, the competition rules and the specific requirements in objective 11.1 and Appendix 6.

Public sector requirements for interoperability, information security, data portability or avoidance of vendor lock-in are likely to be similar across a wide range of different areas of activity (health, pension administration, taxation etc) and across different Member States and regions. The CSA part will support the preparation phase of the joint PCP as to enable public sector bodies in Europe to articulate and federate their requirements for prioritised application areas and to stimulate the emergence of concrete solutions for public sector needs. The CP part will support the execution phase of the joint PCP as to enable public sector bodies to jointly coordinate the development and validation of alternative approaches from different providers against the set of joint requirements defined in the preparation phase.

The scope of the targeted solutions covers both the internal use of Cloud computing for ensuring smooth operation of administrative processes within public sector organisations and the external use of Cloud computing for the provision of e-government type services, through the use of clouds, to citizens and businesses:

- Internal use of Cloud Computing within public sector organisations:

Cloud computing can bring radical improvements in efficiency of IT equipment usage and consequent cost reductions. Improved energy efficiency may also be obtainable. The requirements of public bodies in terms of architecture, interoperability of services, standardisation, data audit and traceability, workflow support etc will be translated into concrete, cloud-based solutions for validation through this action. Certification needs will also be addressed.

- External use of Cloud Computing for the provision of services to citizens and businesses:

Cloud-based services can be a cost-effective way for governments at all levels to provide services to the public as well as other public sector entities. The requirements in terms of mobile access, data protection, security, performance, multi-cultural interfaces will be translated into cloud-based services for validation through this action. The need for interaction with multiple stakeholders will be considered.

The CP-CSA for PCP should build on existing work (e.g. EIF v2.0 or the NIST Reference Model) or identify needs for future standardisation work.

Expected impact

- Improved quality and efficiency of internal public sector operations as well as provisioning of public sector services to external entities, in particular citizens businesses and other public sector organisations, through cloud computing
- Strengthened position of European service and technology providers in the field of cloud computing
- Reduced costs through consolidation of requirements and joint procurement.

Funding Scheme

(a) One CP-CSA for PCP, undertaken jointly by public sector organisations in Member States and associated countries.

Indicative budget distribution

EUR 10 million, of which a maximum of 30% for the CSA part of the CP-CSA.

Call:

FP7-ICT-2013-10

Objective ICT-2013.11.4: Supplements to Strengthen Cooperation in ICT R&D in an Enlarged European Union

Target outcome

The target is to reinforce the cooperation across the enlarged European Union and to strengthen the integration of the European Research Area in ICT.

Integration is characterized by the level of collaboration between relevant organizations within the Member and Associated States and by the appropriate EU-dimension brought into the proposed research results and solutions.

In view of reaching the above target, support will go to the participation of additional partners in on-going FP7/ICT projects with the aim to increase the level of expertise, broaden the scope and/or speed up developments.

Proposals must be presented by the coordinator of the on-going project. In order to ensure the widest impact across the Member and Associated States and European Research Area, the additional partners must be located in countries not already present in the existing consortium and preferably located in countries that are underrepresented at programme level. The funding requested should represent a reasonable extension of the on-going project to achieve the goals of the objective; not exceeding 30% of the Commission funding of the existing project or EUR 1 million, whichever is the lower.

Expected Impact

- Reinforced cooperation and better exploitation of ICT R&D synergies across the enlarged European Union.
- Wider participation in EU-supported ICT research projects across all Member States.
- Paving the way for strategic partnerships in view of gaining access to knowledge, developing standards and interoperable solutions and strengthening European competitiveness.

Funding scheme

Additional funding to on-going FP7 ICT IP and STREP projects ending after June 30, 2014.

Indicative budget distribution

EUR 9 million

Call

FP7-ICT-2013-10

Objective ICT-2013.11.5 Cross border services, investment readiness and legal advice for ICT SMEs, start-ups and entrepreneurs

Target outcomes

(a) Support to groups of leading ICT clusters/incubators/accelerators for delivering cross border services to highly innovative SMEs and entrepreneurs, in view of accelerating their growth.

The aim is to:

- Provide improved facilities and services – eg leading edge experience sharing, high quality networking, training and mentoring activities, markets information - to selected highly innovative ICT start-up's and SME and entrepreneurs;
- Facilitate concrete ways of cooperation to stimulate cross borders development and early European and international exposure of selected highly innovative ICT start-up's and SME and entrepreneurs;
- Put in place operational schemes encouraging more and better cross border venturing in Europe.

(b) Support to a platform to develop investment readiness for participants in ICT projects in EU Framework Programmes; to facilitate interactions with investors and access to finance, for innovative SME's or entrepreneurs in ICT participating in EU programmes or targeted by actions of the Digital Agenda for Europe.

This will build on, continue and rationalise the ICT Finance Marketplace initiative (<http://www.ict-finance-marketplace.com/site/>). Support will go to a single coordination and Support Action animated by a well focused consortium which members should have demonstrated capacity in mobilising Venture Capital firms, Business Angels and other actors investing in high growth SME's in the ICT Field.

(c) Develop bridges between ICT entrepreneurs and start-ups and law students through "law incubators". The aim is that law students give legal advice under the strict supervision of their university teacher, to ICT start-ups and entrepreneurs – in particular web entrepreneurs. Support will go to a Coordination and Support Action involving in a platform a critical mass of law universities, covering specificities of different national legal systems in Europe, and developing links with communities of ICT start-ups and entrepreneurs.

Activities would combine: networking and coordination activities with the European Law Universities of the consortia; definition of the legal expertise to be provided to ICT start-ups and entrepreneurs; elaboration of guidelines tailored to non-legal experts about the specific legal issues related to the ICT sector; dissemination activities about the services offered to the targeted audience.

(d) Develop bridges, networks, contacts between researchers, (PhD) students in ICT projects in EU Framework Programmes on one hand and high potential SMEs, entrepreneurs and business school students on the other hand in order to develop experience sharing on entrepreneurship and to create opportunities for exploiting results and ideas. Support will go to stakeholders having demonstrated capacity in mobilizing ICT entrepreneurs and organisations being in contact with large communities of researchers and students participating in EU R&D project.

The overall objective is to drive innovation, facilitate technology transfer, support entrepreneurship and the creation of start-ups and spinoffs etc, contributing to the exploitation of more innovative products and services out of EU R&D projects. This should be done through actions and events organised in thematic domains as well as the use of existing electronic platforms and networking tools.

Expected impact

- More intense cross border cooperation for improved support to highly innovative SME and entrepreneurs
- Higher investment readiness and better access to investors for innovative SMEs and entrepreneurs
- Improved access to legal advice for innovative SMEs and entrepreneurs
- Experience sharing on entrepreneurship and innovation, creation of opportunities for exploiting R&I ideas and results.

Funding schemes

CSA (Support Actions)

Indicative budget distribution

EUR 5.7 million (4 M€ for (a); 700 k€ for (b); 500 k€ for (c); 500 k€ for (d))

Call

FP7-ICT-2013-10

7.12 Special Action

Objective ICT-2013.12.1 Exascale computing platforms, software and applications

Target Outcomes

This objective focuses on the development of computing platforms, technologies and applications for exascale computing. It aims at leveraging the existing European strengths for building the next generation of extreme performance computing by 2020 and take advantage of the new opportunities created from the transition from peta to exascale computing. This objective builds on the work started following the previous Call on exascale in WP2011-12.

The objective supports systems development work in hardware and software, and the bridging of critical exascale technological gaps with disruptive and innovative approaches (e.g. in libraries, novel algorithms, I/O systems, and programming models).

While computing is addressed under several challenges of this Work Programme, work in this Objective focuses on exascale computing. Thereby it is complementary to the work under Objective 1.2 related to computing architectures for future cloud services, and Objective 3.4 addressing computing systems for embedded systems and for data centres, and Objective 6.2 focusing on energy and environmental performance of data centres.

a) Exascale computing platforms

- Support to the development of a very small number of extreme performance computing platforms (hardware and software) with potential for exascale computing, addressing major challenges of extreme parallelism with millions of cores, including energy efficiency, resilience, I/O, and data-driven/data-intensive computations. The work should be validated with the appropriate application drivers (grand challenge application requirements for exascale computing).

- Each project should bring together one or more supercomputing centres, technology and system suppliers (including system vendor(s) in case of targeting particular vendors' machines), and industrial or academic centres with expertise in grand-challenge application codes.
- Proposals should demonstrate synergies with on-going EC-supported efforts in exascale platforms and the deployment of leadership-class HPC (High Performance Computing) systems under PRACE.

b) Innovative solutions for exascale "technology gaps"

- To develop innovative solutions and disruptive approaches for key exascale computing challenges for which the evolution of existing technologies is clearly insufficient ("exascale technological gap"). Emphasis will be placed on the following areas: (i) new system libraries in the area of I/O, communications and scheduling; (ii) new middleware, programming models and modeling architectures to address the increasing heterogeneity of systems; (iii) improved modularity, parallelisation and scalability of applications. Generic topics targeting concrete solutions for important exascale computing challenges can also be covered (e.g. improved applications for irregular data, numerical mathematics and simulations, etc.).

Expected Impact

- Platforms with clear and highly ambitious scalability targets (e.g. approaching 500 petaflop/s in 2016 - potential for exascale by 2020)
- Strengthened European industry and research in the supply, operation and use of HPC systems, achieving world-leadership; Development of autonomous technology (along the whole spectrum from processor architectures to applications) for building the next generation of extreme performance computing.
- Improved European competitiveness in application areas that are most important for Europe (fundamental sciences, engineering and technology, tackling global challenges such as fighting diseases, energy, climate change etc).
- European research at the forefront of the development of extreme-performance system software and tools;
- Increased return on investments made in PRACE Tier-0 supercomputers and in on-going EC-supported efforts in exascale platforms

Funding Schemes

a) IPs

b) STREPs

Indicative budget distribution

- IP/STREP: EUR 22 million, of which a minimum of 70% allocated to IPs and 25% to STREPs

Call:

FP7-ICT-2013-10

4.1 Content analytics and language technologies	27							27				
4.2 Scalable data analytics	31								31			
4.3 SME initiative on analytics	20						20					
5. ICT for Health, Ageing Well, Inclusion and Governance	142.9											
5.1 Personalised Health, active ageing and independent living	58							58				
5.2 Virtual Physiological Human	31.9							31.9				
5.3 ICT for smart and personalised inclusion	19							19				
5.4 ICT for governance and policy modelling	19							19				
5.5 Collective awareness Platforms for Sustainability and Social Innovation	15							15				
6. ICT for a Low Carbon Economy	173											
6.1 Smart energy grids	18								18			
6.2 Data Centres in an energy-efficient and environmentally friendly Internet	20		20									
6.3 ICT for water resources management	14								14			
6.4: Optimising Energy Systems in Smart Cities	40		40									
6.5 Co-operative mobility	26							26				
6.6 Integrated personal mobility for smart cities	15		15									
6.7: PPP GC: Electro-mobility	40	40										
7. ICT for the Enterprise and Manufacturing	70											
7.1 PPP FoF: Application experiments for robotics and simulation	35	35										
7.2 PPP FoF: Equipment assessment for sensor and laser based applications	35	35										
8. ICT for Creativity and Learning	68											
8.1 Technologies and scientific foundations in the field of creativity	43							43				
8.2 Technology enhanced learning	25								25			
9. Future and Emerging Technologies	210											
FET-Open	65											
9.1 Challenging current Thinking	34										34	
9.2 High-Tech Research Intensive SMEs in FET research	6										6	
9.3 FET Young Explorers	8										8	
9.4 International cooperation on FET research	2										2	
9.5 FET-Open Xtrack	15											15
FET-Proactive	35											

9.6 FET Proactive: Evolving Living Technologies	16							16				
9.7 FET Proactive: Atomic and Molecular Scale Devices and Systems	16							16				
9.8 FET Proactive: Coordinating communities	3							3				
FET-Flagships	110											
9.9 FET Flagships	110							2	108			
10. International Cooperation	22											
10.1 EU-Japan Research and Development Cooperation	9					9						
10.2 EU-Brazil Research and Development Cooperation	5				5							
10.3 International Partnership building and support to dialogues	8							8				
11. Horizontal Actions	33.7											
11.1 Ensuring more efficient higher quality public services through Pre-Commercial Procurement of ICT solutions across sectors of public interest	4							4				
11.2 More efficient and affordable solutions for digital preservation developed and validated against public sector needs through joint Pre-Commercial procurement (PCP)	5								5			
11.3 High quality cloud computing environment for public sector needs, validated through a joint pre-commercial procurement (PCP)	10							10				
11.4 Supplements to Strengthen Cooperation in ICT R&D in an Enlarged European Union	9							9				
11.5 Cross border services, investment readiness and legal advice for ICT SMEs, start-ups and entrepreneurs	5.7							5.7				
12. Special action	22											
12.1 Exascale computing platforms, software and applications	22							22				
Total	1484	110	95	130	5	9	20	705.5	236.5	108	50	15

Other expenditures

Independent experts assisting in proposal evaluations and project reviews

The ICT priority will support independent experts assisting in proposal evaluations, project reviews and for the ICT theme evaluation and monitoring. Indicative budget in 2013: EUR 15 million.

ICT conference, studies, evaluations and reviews

In addition to calls for proposals, calls for tenders for up to EUR 8 million in 2013 are also expected to be published on specific activities that the ICT priority will support. These include:

– Studies including socio-economics and impact analysis studies and studies to support the monitoring, evaluation and strategy definition for the ICT priority in FP7. DG INFSO plans to launch the calls for tenders during the first semester 2013, and conclude indicatively 20 study contracts before year-end. Indicative budget in 2013: EUR 6 million.

– Publications and support to other events (e.g. information, communication, dissemination etc.), either through the use of existing Framework Contracts, or the launch of indicatively 15 calls for tenders during the first semester 2013. Indicative budget in 2013: EUR 2 million.

Details will be provided in the texts of these calls for tender.

The International Human Frontier Science Programme Organisation

As foreseen in the Cooperation Specific Programme an annual subscription to the International Human Frontier Science Programme Organisation (HFSP) ⁴⁸ will be made jointly with the 'Health' theme⁴⁹. This will allow EU non-G8 Member States to fully benefit from the Human Frontier Science Programme (HFSP) and provide increased visibility for European research. According to the conclusions of the Intergovernmental Conference held in Canberra in May 2010 the EU subscriptions for 2013 will be EUR 4 672 000. Out of the total EU subscription EUR 1 869 000 will be paid in 2013 from this Theme⁵⁰, and the remainder from the Health Theme.

IMS Secretariat

The ICT Theme will support the Intelligent Manufacturing Systems secretariat⁵¹ for an amount of EUR 140 000 in 2013.

⁴⁸ The European Union is a Management Support Party (member) of the HFSP Organisation (HFSP) and has funded HFSP under previous Framework Programmes.

⁴⁹ In accordance with Article 14(d) of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

⁵⁰ In accordance with Article 108(2)(d) of the Financial Regulation and Article 160a of the detailed rules of the implementation of the Financial Regulation.

⁵¹ For more information on IMS: <http://cordis.europa.eu/ims>. The European Union participates according to Article 108(2)(d) of the Financial Regulation.

ICT Contribution to General FP7 Activities

The ICT priority will contribute to other general activities including the Cordis service, EUREKA membership, the COST Programme and experts (evaluators and reviewers) related with horizontal activities. A summary of this contribution is given below:

	2013
COST	EUR 11.287.640
Experts (evaluators and reviewers) related with horizontal activities	EUR 26.851
CORDIS	EUR 2.121.213
EUREKA	EUR 107.403
Total	EUR 13.543.107

A summary table of all the above expenditures is given in Appendix 4 of this document.

Call title: ICT call 10

- Call identifier: FP7-ICT-2013-10
- Date of publication⁵²: 10 July 2012
- Deadline⁵³: 15 January 2013, at 17:00.00 Brussels local time
- Indicative budget⁵⁴: EUR 705.5 million⁵⁵

See indicative budget breakdown in section 7 of the ICT work programme.

- Topics called:

Challenge	Objectives	Funding schemes
Challenge 1: Pervasive and Trusted Network and Service Infrastructures	ICT-2013.1.2 Software Engineering, Services and Cloud Computing	IP/STREP, CSA
	ICT-2013.1.3 Digital Enterprise	STREP, CSA
	ICT-2013.1.5 Trustworthy ICT	IP/STREP, CSA
	ICT-2013.1.6 Connected and Social media	IP, STREP, CSA

⁵² The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

⁵³ The Director-General responsible may delay this deadline by up to two months

⁵⁴ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- the final budget of the call may vary by up to 10% of the total value of the indicated budget for the call; and
- any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

⁵⁵ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

	ICT-2013.1.7 Future Internet Research Experimentation (FIRE)	IP, STREP, CSA
Challenge 2: Cognitive systems and robotics	ICT-2013.2.1 Robotics, Cognitive Systems & Smart Spaces, Symbiotic Interaction	IP/STREP
	ICT-2013.2.2 Robotics use cases & Accompanying measures	STREP, CSA
Challenge 3: Alternative Paths to Components and Systems	ICT-2013.3.3 Heterogeneous Integration and take-up of Key Enabling Technologies for Components and Systems	IP/STREP, CSA
	ICT-2013.3.4 Advanced Computing, embedded and Control Systems	IP/STREP, CSA
Challenge 4: Technologies for Digital Content and Languages	ICT-2013.4.1 Content analytics and language technologies	STREP, CSA
Challenge 5: ICT for Health, Ageing Well, Inclusion and Governance	ICT-2013.5.1 Personalised health, active ageing and independent living	IP/STREP, CP-CSA, CSA
	ICT-2013.5.2 Virtual Physiological Human	STREP, CSA
	ICT-2013.5.3: ICT for smart and personalised inclusion	IP/STREP, CSA
	ICT 2013.5.4 ICT for Governance and Policy Modelling	STREP, CSA
	ICT-2013.5.5 Collective Awareness Platforms for Sustainability and Social Innovation	IP/STREP, CSA
Challenge 6: ICT for a Low Carbon Economy	ICT-2013.6.5 Co-operative mobility	IP/STREP, CSA
Challenge 8: ICT for learning and Access to Cultural resources	ICT-2013.8.1 Technologies and scientific foundations in the field of creativity	IP/STREP, CSA
Future and Emerging Technologies	ICT-2013.9.6 FET Proactive: Evolving Living Technologies (EVLIT)	STREP
	ICT-2013.9.7 FET Proactive: Atomic and Molecular Scale Devices and Systems	IP, STREP
	ICT-2013.9.8 Coordinating communities, identifying new research topics for FET Proactive initiatives and fostering interdisciplinary	CSA

	dialogue	
International Cooperation	ICT-2013.10.3 International partnership building and support to dialogues – Horizontal International Cooperation Actions	CSA
Horizontal Actions	ICT-2013.11.1 Ensuring more efficient, higher quality public services through Pre-Commercial Procurement of ICT solutions across various sectors of public interest	CP-CSA
	ICT-2013.11.3 High quality cloud computing environment for public sector needs, validated through a joint pre-commercial procurement (PCP)	CP-CSA
	ICT-2013.11.4 Supplements to Strengthen Cooperation in ICT R&D in an Enlarged European Union	IP, STREP
	ICT-2013.11.5 SME Access to Finance and legal advice	CSA
Special action	ICT-2013.12.1 Exa-scale computing platforms, software and applications	IP, STREP

- Eligibility conditions:

The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants⁵⁶. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. See Appendix 1 of the ICT work programme for further details on the minimum number of participants.

- Evaluation procedure:

- A one-stage submission procedure will be followed.
- The evaluation criteria and sub-criteria (including weights and thresholds), together with the eligibility, selection and award criteria, for the different funding schemes are set out in Annex 2 to the Cooperation work programme.

⁵⁶ For CP-CSAs (Objectives 5.3, 5.4, 11.1), according to Annex 2, criteria for "all funding schemes", "collaborative projects" and "coordination and support actions" apply.

Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadline. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template.

- Particular requirements for prioritisation of proposals with the same score⁵⁷:

The procedure for prioritising proposals which have been awarded the same score (ex aequo) within a ranked list is described below. It will be applied successively for every group of ex aequo proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

(i) Proposals that address topics not otherwise covered by more highly-rated proposals, will be considered to have the highest priority.

(ii) These proposals will themselves be prioritised according to the scores they have been awarded for the criterion impact. When these scores are equal, priority will be based on the scores for the criterion scientific and/or technological excellence. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme.

(iii) The method described in (ii) will then be applied to the remaining ex aequo in the group.

- Specific eligibility and evaluation criteria and specific rules for prioritisation of proposals are applicable to the FET Objectives of this call (see Appendix 5).

- **For Objective ICT-2013.1.7(d) FIRE** additional eligibility, evaluation and selection criteria are as follows:

Proposals which do not include at least one South African participant will be considered ineligible.

- **For Objective ICT-2013.1.7(e) FIRE** additional eligibility, evaluation and selection criteria are as follows:

Proposals which do not include at least one Chinese participant will be considered ineligible.

- **For Objective ICT-2013.1.7(f) FIRE** additional eligibility, evaluation and selection criteria are as follows:

Proposals which do not include at least one South Korean participant will be considered ineligible.

- **For Objective ICT-2013.1.5(e) Trustworthy ICT** additional eligibility, evaluation and selection criteria are as follows:

⁵⁷ For this call, the procedure detailed below replaces the procedure foreseen in Annex 2 for the handling of tied scores.

Proposals which do not include at least one Australian participant will be considered ineligible.

Proposals will only be selected on the condition that the Australian participation will be funded by the Australian Authorities.

In the evaluation, under the criteria 'Impact' and 'Implementation', it should be taken into account if the proposals include a balanced effort between EU-Australia participants and a research plan properly involving coordinated research activities between Europe and Australia.

- For **Objective ICT-2013.11.1 Ensuring more efficient, higher quality public services through Pre-Commercial Procurement of ICT solutions across sectors of public interest and Objective ICT-2013.11.3 High quality cloud computing environment for public sector needs, validated through a joint pre-commercial procurement (PCP) and Objective ICT-2013.5.1(d) Personalised Health, active ageing and independent living, Pre-commercial Procurement Actions (PCP)** additional eligibility are as follows:

The minimum number of participants is three independent legal entities which are public bodies. Each of these must be established in a different Member State or associated country.

- Indicative evaluation and contractual timetable: It is expected that the grant agreement negotiations for the shortlisted proposals will start as of April/May 2013.
- Consortia agreements: Participants in all actions resulting from this call are required to conclude a consortium agreement.
- The forms of grant which will be offered are specified in Annex 3 to the Cooperation work programme.

Call title: ICT call 11

- Call identifier: FP7-ICT-2013-11
- Date of publication⁵⁸: 18 September 2012
- Deadline⁵⁹: 16 April 2013, at 17:00.00 Brussels local time
- Indicative budget⁶⁰: EUR 236.5 million⁶¹

See indicative budget breakdown in section 7 of the ICT work programme.

- Topics called:

⁵⁸ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

⁵⁹ The Director-General responsible may delay this deadline by up to two months

⁶⁰ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- the final budget of the call may vary by up to 10% of the total value of the indicated budget for the call; and
- any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

⁶¹ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

Challenge	Objectives	Funding schemes
Challenge 1: Pervasive and Trusted Network and Service Infrastructures	ICT-2013.1.1 Future Networks	IP/STREP, CSA
Challenge 3: Alternative Paths to Components and Systems	ICT-2013.3.1 Nanoelectronics	STREP, CSA (SA only)
	ICT-2013.3.2 Photonics	IP, STREP, CSA, ERANET Plus
Challenge 4: Technologies for Digital Content and Languages	ICT-2013.4.2 Scalable data analytics	IP/STREP, CSA
Challenge 6: ICT for a Low Carbon Economy	ICT-2013.6.1 Smart Energy Grids	STREP
	ICT-2013.6.3 ICT for water resources management	STREP
Challenge 8: ICT for learning and Access to Cultural resources	ICT-2013.8.2 Technology-enhanced learning	IP/STREP, CP-CSA, CSA
Future and Emerging Technologies	ICT-2013.9.9 FET Flagship Initiatives (b)	CSA
Horizontal Actions	ICT-2013.11.2 More efficient and affordable solutions for digital preservation developed and validated against public sector needs through joint Pre-Commercial Procurement (PCP)	CP-CSA

- Eligibility conditions:

The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants⁶². Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. See Appendix 1 of the ICT work programme for further details on the minimum number of participants.

- Specific Eligibility Criteria for ERA-NET proposals (Objectives 3.2(d) and 9.9(b))

The aim of ERA-NET actions is to network research programmes carried out at national or regional level, with a view to their mutual opening and the development and implementation of joint activities. Such programmes shall have all of the following characteristics:

⁶² For CP-CSA (Objectives 8.2), according to Annex 2, criteria for "all funding schemes", "collaborative projects" and "coordination and support actions" apply.

- Be strategically planned (i.e. be composed of a number of research projects focused on a defined subject area or set of problems, that are scheduled to run for a set period of time and that have a co-ordinated management).
- Be carried out at national or regional level.
- Be either financed or managed directly by national or regional public bodies, or by structures (e.g. agencies) closely related to, or mandated by, public authorities.

The minimum number of participants in an ERA-NET action is **3 independent legal entities** which finance or manage publicly funded national or regional programmes. **Each of these shall be established in a different Member State or Associated Country.**

Partners for ERA-NET actions eligible to satisfy the above conditions are:

- Programme owners: typically national ministries/regional authorities responsible for defining, financing or managing research programmes carried out at national or regional level.
- Programme 'managers' (such as research councils or funding agencies) or other national or regional organisations that *implement* research programmes under the supervision of the programme owners.
- Programme owners (typically national ministries/regional authorities) which do not have a running or fully fledged research programme at the moment of submitting an ERA-NET proposal, but which are planning, and have committed, to set up such a programme, are also eligible if their participation is well justified and adds value to the overall programme coordination.

Sole participants (as referred to in Article 10 of the Rules for Participation) are eligible if the above-mentioned minimum conditions are satisfied by the legal entities forming together a sole participant. A sole participant shall explicitly indicate which of its 'members' are either programme owners or programme managers in the proposed action, and indicate for these members the respective national/regional programmes which are at the disposal of the proposed ERA-NET action.

Provided that the proposal complies with the minimum number of participants required in an ERA-NET action as described above, the following legal entities are eligible:

- a) Programme owners and programme managers not established in a Member State or Associated Country;
 - b) Private legal entities (e.g. charities) which own or manage research programmes, if their participation is well justified and adds value to the overall programme coordination.
- For **Objective ICT-2013.11.2 Joint cross-border pre-commercial procurement (PCP) on more efficient digital preservation and Objective ICT-2013.8.2 (a) Technology-enhanced learning, ICT-enabled learning environments** additional eligibility are as follows:

The minimum number of participants is three independent legal entities which are public bodies. Each of these must be established in a different Member State or associated country.

- Evaluation procedure:
 - A one-stage submission procedure will be followed.

- The evaluation criteria and sub-criteria (including weights and thresholds), together with the eligibility, selection and award criteria, for the different funding schemes are set out in Annex 2 to the Cooperation work programme.

Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadline. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template.

- Particular requirements for prioritisation of proposals with the same score⁶³:

The procedure for prioritising proposals which have been awarded the same score (ex aequo) within a ranked list is described below. It will be applied successively for every group of ex aequo proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

(i) Proposals that address topics not otherwise covered by more highly-rated proposals, will be considered to have the highest priority.

(ii) These proposals will themselves be prioritised according to the scores they have been awarded for the criterion impact. When these scores are equal, priority will be based on the scores for the criterion scientific and/or technological excellence. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme.

(iii) The method described in (ii) will then be applied to the remaining ex aequo in the group.

- Specific eligibility and evaluation criteria and specific rules for prioritisation of proposals are applicable to the FET Objectives of this call (see Appendix 5).
- Indicative evaluation and contractual timetable: It is expected that the grant agreement negotiations for the shortlisted proposals will start as of September/October 2013.
- Consortia agreements: Participants in all actions resulting from this call are required to conclude a consortium agreement.
- The forms of grant which will be offered are specified in Annex 3 to the Cooperation work

Call title: "Factories of the Future"

Public-Private Partnership "Factories of the Future" - Cross-Thematic call implemented between NMP and ICT

- Call identifier: FP7-2013-NMP-ICT-FoF
- Date of publication: 10 July 2012⁶⁴
- Deadline: 4 December 2012⁶⁵ at 17.00.00 (Brussels local time).
- Indicative budget⁶⁶ : EUR 230 million⁶⁷ from the 2013 budget of which:

⁶³ For this call, the procedure detailed below replaces the procedure foreseen in Annex 2 for the handling of tied scores.

⁶⁴ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

⁶⁵ The Director-General responsible may delay this deadline by up to two months

- EUR 160 million from Theme 4 – Nanosciences, Nanotechnologies, Materials & New Production Technologies

- EUR 70 million from Theme 3 – Information and Communication Technologies (ICT)

- Topics called:

Activity/ Area	Topics called	Funding Schemes	Budget (Million EUR)
NMP – Nanosciences, nanotechnologies, Materials and new Production			
FoF.NMP.2013-1	Improved use of renewable resources at factory level	DEMO-targeted collaborative projects	<i>160</i>
FoF.NMP.2013-2	Innovative re-use of modular equipment based on integrated factory design	DEMO-targeted collaborative projects	
FoF.NMP.2013-3	Workplaces of the future: the new people-centred production site	Small or medium-sized collaborative projects	
FoF.NMP.2013-4	Innovative methodologies addressing social sustainability in manufacturing	Coordination and Support Actions (Support action)	
FoF.NMP.2013-5	Innovative design of personalised product-services and of their production processes based on collaborative environments	Large-scale integrated collaborative projects	
FoF.NMP.2013-6	Mini-factories for customised products using local flexible production	DEMO-targeted collaborative projects	
FoF.NMP.2013-7	New hybrid production systems in advanced factory environments based on new human-robot interactive cooperation	Large-scale integrated collaborative projects	
FoF.NMP.2013-8	Innovative strategies for renovation and repair in manufacturing systems	Large-scale integrated collaborative projects	

⁶⁶ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- the final budget of the call may vary by up to 10% of the total value of the indicated budget for the call; and
- any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

⁶⁷ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

FoF.NMP.2013-9	Advanced concepts for technology-based business approaches addressing product-services and their manufacturing in globalised markets	Small or medium-sized collaborative projects	
FoF.NMP.2013-10	Manufacturing processes for products made of composites or engineered metallic materials	Small or medium-sized collaborative projects	
FoF.NMP.2013-11	Manufacturing of highly miniaturised components	SME-targeted collaborative projects	
ICT – Information and Communication Technologies			
FoF-ICT-2013.7.1	Application experiments for robotics and simulations	<i>Collaborative Projects (IP only) and CSA</i>	
FoF-ICT-2013.7.2	Equipment assessment for sensor and laser based applications	<i>Collaborative Projects (IP only) and CSA</i>	70

- **Eligibility conditions:**

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation: For Collaborative projects, the minimum condition shall be the participation of 3 independent legal entities, each of which is established in a Member State or Associated Country and no two of which are established in the same Member State or Associated Country.

For Coordination and Support Actions, the minimum conditions shall be:

- Coordination and Support Actions – **coordinating actions**: at least 3 independent legal entities, each of which is established in a Member State or Associated Country, and no 2 of which are established in the same Member State or Associated Country.
- Coordination and Support Actions – **supporting actions**: at least 1 independent legal entity.

- **Additional eligibility criteria**

Topics FoF.NMP.2013-5, FoF.NMP.2013-7 and FoF.NMP.2013-8: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Large-scale integrating collaborative projects **the minimum requested EU contribution must be greater than EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

Topics FoF.NMP.2013-3, FoF.NMP.2013-9 and FoF.NMP.2013-10: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Small or medium-sized collaborative projects **the maximum requested EU contribution must not exceed EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

Topic FoF.NMP.2013-11: SME-targeted Collaborative Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 35% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Topic FoF.NMP.2013-4: The requested EU contribution must not exceed EUR 500 000, and the project duration must not exceed 18 months.

For the ICT topics, each proposal must indicate the type of funding scheme used (IP for Collaborative Projects where applicable; CA or SA for Coordination and Support Actions). See Appendix 2 to the ICT chapter of the Cooperation work programme for further details.

- **Evaluation procedure:**

A one-stage submission procedure will be followed.

Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

Each Theme will remain responsible for its own budget and for the implementation of the respective call topics. This includes drawing up ranking lists per Theme and subsequent negotiation and follow-up of the grant agreements resulting from proposals selected under the respective call topics.

For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

See also Annex 2: Eligibility, Evaluation criteria for proposals and priority order for proposals with the same score⁶⁸.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

▪ **Indicative evaluation and contractual timetable:**

Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

▪ **Consortium agreements**

Participants are required to conclude a consortium agreement.

▪ **Particular requirements for participation, evaluation and implementation:**

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up by each Theme as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Use of flat rates for subsistence costs**

For topics FoF.NMP.2013, and in accordance with Annex 3 to this Work Programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents, under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

⁶⁸ For the NMP Programme, and in contrast with Annex 2, at Panel stage, the priority order of the proposals with equal overall scores will be established in accordance with their scores for the S/T Quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If proposals are still tied, they will be prioritised on the basis of the work programme coverage.

Call title: "ICT for Green Cars"

Call identifier: FP7-2013-ICT-GC

- Date of publication⁶⁹: 10 July 2012
- Deadline⁷⁰: 4 December 2012 at 17.00.00 (Brussels local time)
- Indicative budget⁷¹: EUR 40 million⁷²

See indicative budget breakdown in Section 7 of the ICT work programme.

- Topics called:

Activity/ Area	Objectives	Funding schemes	Budget
ICT – Information and Communication Technologies			
GC-ICT-2013.6.7	Electro-mobility	<i>Collaborative Projects (IP, STREP) and Coordination and Support Actions (CSA)</i>	40

An overview of all PPP-related topics is provided in Annex 5.

- Eligibility conditions:

The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. See Appendix 1 of the ICT work programme for further details on the minimum number of participants.

⁶⁹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁷⁰ The Director-General responsible may delay this deadline by up to two months

⁷¹ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

⁷² Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

- Evaluation procedure:

A one-stage submission procedure will be followed.

Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

See also Annex 2: Eligibility and evaluation criteria for proposals and priority order for proposals with the same score.

In order to ensure industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

- Indicative evaluation and contractual timetable:

Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

- Consortia agreements:

Consortia agreements are required for *all* actions.

- Particular requirements for participation, evaluation and implementation:

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up by Theme as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

The forms of grants and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.

Call title: "Smart Cities and Communities"

Smart Cities is a target research and innovation area in the future European Framework Programme for Research and Innovation. In order to prepare the constituency, the Themes ICT and ENERGY are launching this Cross-Thematic call.

Call title: "Smart Cities and Communities"

- **Call identifier:** FP7-SMARTCITIES-2013

- **Date of publication:** 10 July 2012⁷³
- **Deadline:** 4 December 2012 ⁷⁴ at 17.00.00 (Brussels local time).
- **Indicative budget** ^{75, 76}: EUR 209 million from the budget of which:
 - EUR 95 million from Theme 3 – Information and Communication Technologies (ICT)
 - EUR 114 million from Theme 5 – Energy

Activity/ Area	Budget (Million EUR)
Theme 3 – Information and Communication Technologies (ICT)	
FP7-ICT-2013.1.4	20
FP7-ICT-2013.6.2	20
FP7-ICT-2013.6.4	40
FP7-ICT-2013.6.6	15
Theme 5 – Energy	
Area Energy.7.1: Development of Inter-Active Distribution Energy Networks	24
Area Energy 7.3: Cross Cutting Issues and Technologies	
Area ENERGY.8.8: Smart Cities and Communities	90

- **Topics called:**

Activity/ Area	Topics called	Funding Schemes
Theme 3 – Information and Communication Technologies (ICT)		

⁷³ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

⁷⁴ The Director-General responsible may delay this deadline by up to two months

⁷⁵ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

⁷⁶ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- the final budget of the call may vary by up to 10% of the total value of the indicated budget for the call; and
- any repartition of the call sub-budgets may also vary by up to 10% of the total value of the indicated budget for the call.

FP7-ICT-2013.1.4	A reliable, smart and secure Internet of Things for Smart Cities	Collaborative Projects (STREP only) and CSA
FP7-ICT-2013.6.2	Data Centres in an energy-efficient and environmental friendly Internet	Collaborative Projects (STREP only)
FP7-ICT-2013.6.4	Optimising Energy Systems in Smart Cities	Collaborative Projects (STREP only) and CSA
FP7-ICT-2013.6.6	Integrated personal mobility for smart cities	Collaborative Projects (STREP only)
Theme 5 – Energy		
Area Energy.7.1: Development of Inter-Active Distribution Energy Networks	Topic ENERGY.2013.7.1.1: Development and validation of methods and tools for network integration of distributed renewable resources	<i>Collaborative Project</i>
Area Energy 7.3: Cross Cutting Issues and Technologies	Topic ENERGY.2013.7.3.1: Planning rules for linking electric vehicles (EV) to distributed energy resources <i>Up to one project may be funded</i>	
	Topic ENERGY.2013.7.3.2: Enhanced interoperability and conformance testing methods and tools for interaction between grid infrastructure and electric vehicles <i>Up to one project may be funded</i>	
Area ENERGY.8.8: Smart Cities and Communities	Topic ENERGY.2013.8.8.1: Demonstration of optimised energy systems for high performance-energy districts	Collaborative Project with a predominant demonstration component

The topics FP7.ENERGY.2013.8.8.1 and FP7-ICT-2013.6.4 contribute to the objectives of the Energy-Efficient building PPP.

Other topics related to Smart Cities and Communities, but not included in this call, are:

- Call FP7-ICT-2013-GC, GC-ICT-2013.6.7: Electro-mobility, see Theme 3 (ICT), part of PPP Green Cars
- Call FP7-2013-NMP-ENV-EeB, EeB.NMP.2013-3: Integration of technologies for energy-efficient solutions in the renovation of public buildings, see Theme 4 (NMP), part of PPP EeB
- Call FP7-2013-NMP-ENV-EeB, EeB.NMP.2013-4: Integrated control systems and methodologies to monitor and improve building energy performance see Theme 4 (NMP), part of PPP EeB
- Call FP7-2013-NMP-ENV-EeB, EeB.NMP.2013-5: Optimised design methodologies

for energy-efficient buildings integrated in the neighbourhood energy systems
see Theme 4 (NMP), part of PPP EeB

- Call FP7-2013-NMP-ENV-EeB, EeB.NMP.2013-6: Achieving high efficiency by deep retrofitting in the case of commercial buildings
see Theme 4 (NMP), part of PPP EeB
- Call FP7-2013-NMP-ENV-EeB, EeB.ENV.2013.6.3-4: Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts,
see Theme 6 (ENV), part of PPP EeB

- **Eligibility conditions**

The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. They are summarised in the table below:

Funding scheme	Minimum conditions
Collaborative Projects	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (coordinating action)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (supporting action)	At least 1 independent legal entity.

- **Evaluation procedure**

A one-stage submission procedure will be followed.

Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

Each Theme will be responsible for its own budget and for the implementation of the respective call topics. This includes drawing up ranking lists per budgetary envelope and subsequent negotiation and follow-up of the grant agreements resulting from the proposals selected under the respective call topics.

For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the

possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

See also Annex 2: Eligibility and evaluation criteria for proposals and priority order for proposals with the same score.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

The maximum number of projects that may be funded under a specific topic is restricted in the following topics:

- Topic ENERGY.2013.7.3.1: Planning rules for linking electric vehicles (EV) to distributed energy resources: up to one project may be funded
- Topic ENERGY.2013.7.3.2: Enhanced interoperability and conformance testing methods and tools for interaction between grid infrastructure and electric vehicles: up to one project may be funded

• **Indicative evaluation and contractual timetable:**

Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

• **Consortia agreements**

Consortia agreements are required for *all* actions.

• **Particular requirements for participation, evaluation and implementation:**

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up for each budget envelope as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

The forms of grants and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.

Call title: "Future Internet"

Public-Private Partnership "Future Internet"

- Call identifier: FP7-2013-ICT-FI
- Date of publication: 16 May 2013

- Deadline: 10 December 2013 at 17.00.00 (Brussels local time)
- Indicative budget⁷⁷: EUR 130 million⁷⁸

See indicative budget breakdown in section 7 of the ICT work programme.

- Topics called:

Challenge	Objectives	Funding schemes
Challenge 1: Pervasive and Trusted Network and Service Infrastructures	FLICT-2013.1.8 Expansion of Use Case	CP-CSA
	FLICT-2013.1.9 Technology Foundation Extension and Usage	IP/CSA

- Eligibility conditions:

The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. See Appendix 1 of the ICT work programme for further details on the minimum number of participants.

- Evaluation procedure:

- A one-stage submission procedure will be followed.
- The evaluation criteria and sub-criteria (including weights and thresholds), together with the eligibility, selection and award criteria, for the different funding schemes are set out in Annex 2 to the Cooperation work programme.

Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadline. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template.

- Particular requirements for prioritisation of proposals with the same score:

The procedure for prioritising proposals which have been awarded the same score (ex aequo) within a ranked list is described below. It will be applied successively for every group of ex aequo proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

⁷⁷ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

⁷⁸ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

(i) Proposals that address geographies and/or domains not otherwise covered by more highly-rated proposals, will be considered to have the highest priority.

(ii) These proposals will themselves be prioritised according to the scores they have been awarded for the criterion impact. When these scores are equal, priority will be based on the scores for the criterion Quality and efficiency of the implementation and the management. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme.

(iii) The method described in (ii) will then be applied to the remaining ex aequo in the group.

- Indicative evaluation and contractual timetable: It is expected that the grant agreement negotiations for the shortlisted proposals will start as of May 2014.
- **Typically grant agreements resulting from this call will include Special Clause 39 'Open Access'.**
- Consortia agreements: Participants in all actions resulting from this call are required to conclude a consortium agreement. Special clause 41 'Complementary Grant Agreements' and the provisions therein will be applicable to all projects selected under this call.

The forms of grant which will be offered are specified in Annex 3 to the Cooperation work programme.

Call title: SME Initiative on Analytics

- Call identifier: FP7-ICT-2013-SME-DCA
- Date of publication⁷⁹: 10 July 2012
- Deadline⁸⁰: 15 January 2013, at 17:00.00 Brussels local time
- Indicative budget⁸¹: EUR 20 million⁸²

See indicative budget breakdown in section 7 of the ICT work programme.

- Topics called:

Challenge	Objectives	Funding schemes
Challenge 4: Technologies for Digital Content and Languages	4.3 SME initiative on analytics	IP, STREP

⁷⁹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁸⁰ The Director-General responsible may delay this deadline by up to two months

⁸¹ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

⁸² Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

- Eligibility conditions:

The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. See Appendix 1 of the ICT work programme for further details on the minimum number of participants.

In addition to the eligibility criteria set out in Annex 2, STREP proposals submitted to this call are subject to the following additional eligibility criteria:

1. The consortium must contain at least **two SMEs** (this will be declared in Part A of the proposal).⁸³
2. The project duration shall not exceed **24 months** and the maximum EU funding requested must not exceed **EUR 1.500.000**.
3. A minimum of **30% of the funding** requested in the proposal must be allocated to SME partners and maintained in the negotiated EU grant if the proposal is selected for funding.
4. The length of Part B should not exceed **20 A4 pages**, excluding a title page.

In addition to the eligibility criteria set out in Annex 2, IP proposals submitted to this call are subject to the following additional eligibility criteria:

1. The length of Part B should not exceed **50 A4 pages**, excluding a title page.

- Evaluation procedure:

A one-stage submission and evaluation procedure will be followed:

Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadlines.

Proposals submitted under this call will be evaluated according to three criteria - Scientific/Technological Excellence, Implementation and Impact. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores.

	1. Scientific and/or technological excellence (relevant to the topics addressed by the call) (Award)	2. Quality and efficiency of the implementation and the management (Selection)	3. The potential impact through the development, dissemination and use of project results (Award)
STREP	• Soundness of	• Appropriateness	• Contribution, at the

⁸³ The official definition of SMEs can be found at http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/sme-definition/index_en.htm.

and IP proposal	concept and quality of objectives <ul style="list-style-type: none"> • Progress beyond the state-of-the-art • Quality and effectiveness of the S/T methodology and associated work plan 	of the management structure and procedures. <ul style="list-style-type: none"> • Quality and relevant experience of the individual participants • Quality of the consortium as a whole (including complementarity, balance) • Appropriateness of the allocation and justification of the resources to be committed (budget, staff, equipment) 	European [and/or international] level, to the expected impacts listed in the work programme under relevant topic/activity <ul style="list-style-type: none"> • Appropriateness of measures for the dissemination and/or exploitation of project results, and management of intellectual property
	Threshold: 4/5	Threshold: 4/5	Threshold: 4/5

Thresholds are set for each criterion, as indicated in the tables above. A proposal failing to achieve any of these threshold scores will be rejected.

- Particular requirements for prioritisation of proposals with the same score⁸⁴:

The procedure for prioritising proposals which have been awarded the same score (ex aequo) within a ranked list is described below. It will be applied successively for every group of ex aequo proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

- (i) Proposals that address topics not otherwise covered by more highly-rated proposals, will be considered to have the highest priority.
- (ii) These proposals will themselves be prioritised according to the scores they have been awarded for the criterion impact. When these scores are equal, priority will be based on the scores for the criterion scientific and/or technological excellence. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme.
- (iii) The method described in (ii) will then be applied to the remaining ex aequo in the group.

- Indicative evaluation and contractual timetable: It is expected that the grant agreement negotiations for the shortlisted proposals will start as of April/May 2013.
- Consortia agreements: Participants in all actions resulting from this call are required to conclude a consortium agreement.
- The forms of grant which will be offered are specified in Annex 3 to the Cooperation work programme.

⁸⁴ For this call, the procedure detailed below replaces the procedure foreseen in Annex 2 for the handling of tied scores.

- Grant agreements of projects financed under this Call for Proposals under Objective 4.3 will include the Special Clause 39 on the Open Access Pilot in FP7

Call title: "FET Flagship Initiatives"

- Call identifier: FP7-ICT-2013-FET-F
- Date of publication⁸⁵: 10 July 2012
- Deadline⁸⁶: 23 October 2012 at 17.00.00 (Brussels local time)
- Indicative budget⁸⁷: EUR 108 million⁸⁸
- Topics called:

Challenge	Objectives	Funding schemes
Challenge 9: Future and Emerging Technologies	ICT 2013.9.9 FET Flagships	CP-CSA

- Eligibility conditions:

The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. See Appendix 1 of the ICT work programme for further details on the minimum number of participants.

- Evaluation procedure:

Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadline. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template.

- A one-stage submission procedure will be followed.

⁸⁵ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁸⁶ The Director-General responsible may delay this deadline by up to two months

⁸⁷ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

⁸⁸ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

See Appendix 5 of the work programme for specific evaluation criteria applicable to the FET Flagship objective ICT-2013.9.9.

Call title: FET Open

- Call identifier: FP7-ICT-2013-C
- Date of publication⁸⁹: 12 September 2012
- Deadline⁹⁰: 12 March 2013, at 17:00.00, Brussels, local time
- Indicative budget⁹¹: EUR 50 million⁹²
- See indicative budget breakdown in section 7 of the ICT work programme.
- Topics called:

Challenge	Objectives	Funding schemes ⁹³
Future and emerging technologies	<u>ICT-2013.9.1 FET-Open: Challenging current thinking</u>	CP (STREP only), CSA
	<u>ICT-2013.9.2 High Tech Research Intensive SMEs in FET research</u>	CP (STREP only)
	<u>ICT-2013.9.3 FET Young Explorers</u>	CP (STREP only)
	<u>ICT-2013.9.4 International Cooperation in FET research</u>	Additional funding to existing grants (IP/STREP)

- Eligibility conditions:

Eligibility, evaluation, selection and award criteria: see Appendix 5 of the work programme for specific eligibility and evaluation criteria applicable to FET Open.

- Evaluation procedure:
 - for objectives ICT-2013.9.1: Challenging current Thinking, ICT-2013.9.2: High-Tech Research Intensive SMEs in FET research, ICT-2013.9.3: FET Young Explorers:

⁸⁹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁹⁰ The Director-General responsible may delay this deadline by up to two months

⁹¹ ⁹¹ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

⁹² Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

⁹³ Each proposal should indicate the type of funding scheme used (IP or STREP for CP, where applicable; CA or SA for CSA, where applicable)

- proposals for STREP have to be submitted in two stages: first a *short*, strictly anonymous, proposal of maximum five pages (excluding a single title page) is submitted describing the key objectives and motivation for the proposed work;
 - *short* proposals may be submitted at any time from the opening of the call until 11/09/2012 (short proposal end date submission period as indicated in the table below). They are evaluated anonymously as they come in with the help of remote evaluators;
 - Evaluation Summary Reports will be sent to all proposers after the first stage evaluation;
 - if the *short* proposal is successful, the proposers are invited to submit a *full* proposal by a specified cut-off date. This cut-off date is determined by the submission date of the *short* proposal, as indicated in the table below;
 - *full* proposals are evaluated through a combination of remote evaluation and panels of experts that convene in Brussels; they are not evaluated anonymously.
 - proposals for CSA are submitted in one stage and are not evaluated anonymously. They are continuously receivable until 12 March 2013
- o for objectives ICT-2013.9.4: International cooperation on FET research:
- proposals for additional funding to existing grant for on-going FET⁹⁴ IP and STREP are submitted in one stage and are not evaluated anonymously
 - proposals are evaluated through a combination of remote evaluation and panels of experts that convene in Brussels
 - proposals are continuously receivable until 12 March 2013.

Batch	Short STREP proposals start date submission period	Short STREP proposals end date submission period	full STREP and CSA cut-off date (at 17:00 Brussels time)
14	26/10/2011	10/04/2012	25/09/2012
15	11/04/2012	11/09/2012	12/03/2013

FET-Open proposals submitted to batch 14 will be evaluated based on call text and eligibility, evaluation, selection and award criteria set-out in ICT Work Programme 2011/2012.

- Indicative evaluation and contractual timetable
 - Evaluation results for *short* proposals: three months from proposal reception;
 - Evaluation results for *full* proposals: three months from the cut-off or closure date.
- Consortia agreements

It is not mandatory that participants in RTD actions resulting from this call conclude a consortium agreement although such agreements are strongly recommended.

Call title: FET Open Xtrack

- Call identifier: FP7-ICT-2013-X

⁹⁴ Projects selected under the FET objectives of the FP7 ICT Workprogrammes.

- Date of publication⁹⁵: 12 September 2012
- Deadline⁹⁶: 29 January 2013, at 17:00.00, Brussels, local time
- Indicative budget⁹⁷: EUR 15 million⁹⁸
- See indicative budget breakdown in section 7 of the ICT work programme.
- Topics called:

Challenge	Objectives	Funding schemes
Future and emerging technologies	<u>ICT-2013.9.5 FET-Open Xtrack</u>	CP (STREP only)

- Eligibility conditions:

See Appendix 5 of the work programme for specific eligibility and evaluation criteria applicable to the FET Open objective ICT-2013.9.5 FET-Open Xtrack.

- Evaluation procedure:

- proposals for STREP can be submitted anytime during the submission period. The submission is single stage.
- Section 1 of any eligible proposal is evaluated anonymously as it comes in with the help of a minimum of 3 remote evaluators. At this stage only the S/T Quality, in the sense of Appendix 5 of the ICT workprogramme, is evaluated;
- An Evaluation Summary Report is sent to all proposers that fail to pass the evaluation threshold for S/T Quality;
- Proposals that pass the evaluation threshold for S/T Quality are further evaluated on all criteria through a combination of remote evaluation and panels of experts that convene in Brussels; they are not evaluated anonymously.

- Indicative evaluation and contractual timetable

- Proposals that fail to pass the first step of remote evaluation of S/T Quality: Evaluation results expected by May 2013.
- Proposals that pass the first step of remote evaluation of S/T Quality: Evaluation results expected by June 2013.

- Consortium agreements

It is not mandatory that participants in RTD actions resulting from this call conclude a consortium agreement although such agreements are strongly recommended.

⁹⁵ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁹⁶ The Director-General responsible may delay this deadline by up to two months

⁹⁷ ⁹⁷ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

⁹⁸ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

Call title: ICT – EU Japan Coordinated Call

- Call identifier: FP7-ICT-2013-EU-Japan
- Date of publication: 2 October, 2012.⁹⁹
- Deadline: 29 November 2012 at 17.00.00 (Brussels local time)¹⁰⁰ and for the coordinated projects funded by the Japanese authorities (Ministry of Internal Affairs and Communications, MIC, and the National Institute of Information and Communications Technology, NICT) on 29 November 2012 at 17.00.00 (Tokyo local time) according to the respective requirements of the EU and Japan.
- Indicative budget¹⁰¹: EUR 9 million¹⁰² (a similar budget for the call is expected from MIC and NICT).

All budgetary figures given in this work programme are indicative. The final EU budget awarded to this call, following the evaluation of proposals, may vary by up to 10% of the total value of the call.

See indicative budget breakdown in section 7 of the ICT work programme.

- Topics called

Topic called	Topics	Funding Scheme
ICT-2013.10.1 EU-Japan Research and Development cooperation	a): Optical communications	Small or medium scale focused research projects (STREPs)
	b) Wireless communications	
	c) Cybersecurity for improved resilience against cyber threats	
	d) Extending the cloud paradigm to the Internet of Things – Connected object and sensor clouds within the service perspective	
	e) Federation of testbeds: Control, tools and experiments	

⁹⁹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

¹⁰⁰ The Director-General responsible may delay this deadline by up to two months.

¹⁰¹ ¹⁰¹ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call, and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

¹⁰² Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

	f) Green & content centric networks	
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- Eligibility conditions:

The eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating legal entities required for this call is summarised in the table below¹⁰³:

Funding scheme	Minimum conditions
Collaborative Projects STREPs	At least 3 independent legal entities, each of which is established in a MS or AC , and no two of which are established in the same MS or AC.

- Additional eligibility criterion:

Proposals submitted to this call which do not include coordination with a Japanese proposal will be considered ineligible.

- Evaluation procedure:

- The evaluation shall follow a single-step procedure.
- The proposals will be evaluated by a panel including both European and Japanese experts.
- Proposals will not be evaluated anonymously.

- Evaluation criteria and thresholds:

The evaluation criteria and sub-criteria to be applied to this coordinated call are given in Annex 2 of this work programme.

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum scores
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall required score	10/15

The following points will be reflected in the evaluation:

¹⁰³ MS = Member States of the EU; AC = Associated Country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated country.

The financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

In order to ensure a more genuine EU-Japan cooperation, a balanced effort between the two coordinated projects and a research plan properly involving coordinated research activities between Europe and Japan, represent an added value to the activities and this will be reflected in the evaluation under the criteria 'Impact' and 'Implementation'.

At Panel stage, the priority order of the proposals with equal overall scores will be established.

- Additional selection criterion:

Proposals will only be selected on the condition that their corresponding coordinated Japanese project will be funded by MIC or NICT.

Up to one proposal per topic may be funded under this call: That is one proposal for each one of the six topics implemented via Small or medium scale focused research projects (STREPs).

- Submission conditions:

Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadline. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template.

In terms of reciprocity, EU retained proposals will be made available to MIC/NICT and vice versa.

- Indicative evaluation and contractual timetable:

Evaluations are expected to be carried out in January 2013; Evaluation results: estimated to be available within 10-12 weeks after the closure date. Negotiations will be carried out in parallel by the EU and MIC or NICT, in order to have a simultaneous start of the respective grant agreements. It is expected that the grant agreement negotiations for the short-listed proposals will start as of February 2013 and that all projects will start work early in April 2013.

- Consortium agreements:

Participants in all EU actions resulting from this call are required to conclude a consortium agreement prior to the grant agreement.

- Coordination agreements:

Participants in the EU Collaborative Projects are required to conclude a coordination agreement with the participants in the coordinated project funded by MIC or NICT. A final draft of these agreements has to be provided with the proposal.

- Other points:

The forms of grant and maximum reimbursement rates which will be offered for projects funded through the Cooperation Programme are specified in Annex 3 to this work programme.

Call title: ICT – EU Brazil Coordinated Call

- Call identifier: FP7-ICT-2013-EU-Brazil

- Date of publication: 12 September, 2012.¹⁰⁴
- Deadline: 12 December, 2012 at 17.00.00 (Brussels local time)¹⁰⁵ and for the coordinated projects funded by the Brazilian Authorities on 12 December, 2012 at 18.00.00 (Brasilia local time) according to the respective requirements of the EU and the Brazilian Ministry of Science and Technology and Innovation (MCTI).
- Indicative budget¹⁰⁶: EUR 5 million¹⁰⁷ (a similar budget for the call is expected from the Brazilian Ministry of Science, Technology and Innovation (MCTI)).

All budgetary figures given in this work programme are indicative. The final budget awarded to this call, following the evaluation of proposals, may vary by up to 10% of the total value of the call.

See indicative budget breakdown in section 7 of the ICT work programme.

- Topics called

Topic called	Topics	Funding Scheme
ICT-2013.10.2 EU-Brazil Research and Development cooperation	a): Cloud computing for Science	Small or medium scale focused research projects (STREPs)
	b) Sustainable technologies for a Smarter Society	
	c) Smart Services and applications for a Smarter Society	
	d) hybrid broadcast-broadband TV applications and services	

- Eligibility conditions:

The eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

¹⁰⁴ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

¹⁰⁵ The Director-General responsible may delay this deadline by up to two months.

¹⁰⁶ ¹⁰⁶ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call, and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

¹⁰⁷ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

The minimum number of participating legal entities required for this call is summarised in the table below¹⁰⁸:

Funding scheme	Minimum conditions
Collaborative Projects STREPs	At least 3 independent legal entities, each of which is established in a MS or AC , and no two of which are established in the same MS or AC.

- Additional eligibility criterion:

Proposals which do not include coordination with a Brazilian project will be considered ineligible. Therefore, the EU project proposals must include detailed explanations about the coordinated Brazilian proposal submitted in parallel to the Brazilian Authorities.

In addition, for each small or medium scale focused research project, the proposed project duration shall not exceed 36 months and the maximum EU funding requested must not exceed **EUR 1.500.000**.

- Evaluation procedure:

- The evaluation shall follow a single-step procedure.
- The proposals will be evaluated by a panel including both European and Brazilian experts.
- Proposals will not be evaluated anonymously.

- Evaluation criteria and thresholds:

The evaluation criteria and sub-criteria to be applied to this coordinated call are given in Annex 2 of this work programme.

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

The following points will be reflected in the evaluation:

The financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

In order to ensure a more genuine EU-Brazil cooperation, a balanced effort between the two coordinated projects and a research plan properly involving coordinated research activities between Europe and Brazil, represent an added value to the activities and this will be reflected in the evaluation under the criteria 'Impact' and 'Implementation'.

¹⁰⁸ MS = Member States of the EU; AC = Associated Country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated country.

At Panel stage, the priority order of the proposals with equal overall scores will be established in accordance with work programme coverage. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If they are still tied, they will be prioritised according to their scores for the S/T Quality criterion.

- Additional selection criterion:

Proposals will only be selected on the condition that their corresponding coordinated Brazilian project will be funded by the Brazilian Authorities.

Up to one proposal per topic may be funded under this call: That is one proposal for each one of the four topics implemented via Small or medium scale focused research projects (STREPs).

- Submission conditions:

Proposal submission must be made by means of the electronic Submission Services of the Commission on or before the published deadline. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template.

In terms of reciprocity, non confidential abstracts of EU retained proposals will be made available to the Brazilian Authorities.

- Indicative evaluation and contractual timetable:

Evaluations are expected to be carried out in January-February, 2013. Evaluation results: estimated to be available within 9-11 weeks after the closure date. Negotiations will be carried out in parallel by the EU and the Brazilian Authorities, in order to have a simultaneous start of the respective grant agreements. It is expected that the grant agreement negotiations for the short-listed proposals will start as of end February 2013 and that all projects will start work early in July 2013.

- Consortium agreements:

Participants in all EU actions resulting from this call are required to conclude a consortium agreement prior to the grant agreement.

- Coordination agreements:

Participants in the EU Collaborative Projects are required to conclude a coordination agreement with the participants in the coordinated project funded by the Brazilian Authorities. A final draft of these agreements has to be provided with the proposal.

- Other points:

The forms of grant and maximum reimbursement rates which will be offered for projects funded through the Cooperation Programme are specified in Annex 3 to this work programme.

Appendix 1: Minimum number of participants

Minimum number of participants¹⁰⁹ as set out in the Rules for Participation

Funding scheme	Minimum conditions
Collaborative project	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Collaborative project for specific cooperation actions dedicated to international cooperation partner countries (SICAs)	At least 4 independent legal entities. Of these, 2 must be established in different MS or AC. The other two must be established in different international cooperation partner countries
Network of excellence	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Co-ordination action	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Support action	At least 1 independent legal entity
Collaborative Project and Coordination and Support Action	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.

Appendix 2: Funding schemes

1. Collaborative projects (CP)

Support to research projects carried out by consortia with participants from different countries, aiming at developing new knowledge, new technology, products, demonstration activities or common resources for research. The size, scope and internal organisation of projects can vary from field to field and from topic to topic. Projects can range from small or medium-scale focused research actions to large-scale integrating projects for achieving a defined objective. Projects may also be targeted to special groups such as SMEs.

The Funding Scheme allows for two types of projects to be financed: a) '*small or medium-scale focused research actions*', b) '*large-scale integrating projects*'.

¹⁰⁹ MS = Member States of the EU; AC = Associated Country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated country

a) Small or medium-scale focused research actions (STREP)

Purpose

Small or medium-scale focused research projects (STREP) are objective-driven research projects, which aim at generating new knowledge, including new technology, or common resources for research in order to improve European competitiveness, or to address major societal needs. They have clearly defined scientific and technological objectives directed at obtaining specific results, which could be applicable in terms of development or improvement of products, processes, services or policy.

STREPs target a specific research objective in a sharply focused approach. They have a fixed overall work plan where the principal deliverables are not expected to change during the lifetime of the project.

Size and resources

There must be at least three 'legal entities' established in different EU Member States or Associated countries. The entities must be independent of each other.

A higher number of participants may be specified on a call-by-call basis: check the call fiche.

The size, scope and internal organisation of collaborative projects can vary from research theme to research theme and from topic to topic. During FP6 the number of participants in STREPs for the IST priority varied from 6 to 15 participants and the EU contribution varied between EUR 1 million and EUR 4 million, with an average around the EUR 2 million.

Duration

STREPs are expected to last typically eighteen months to three years. However, there is no formal minimum or maximum duration.

Activities

The activities to be carried out in the context of a STREP can include:

- a) research and technological development activities, reflecting the core activities of the project, aimed at a significant advance beyond the established state-of-the-art
- b) demonstration activities, designed to prove the viability of new technologies that offer a potential economic advantage, but which cannot be commercialised directly (e.g. testing of product-like prototypes)
- c) management activities, over and above the technical management of individual work packages, linking together all the project components and maintaining communication with the Commission.

SICAs

STREPs may also be used to support a special form of international co-operation projects, the so-called Specific International Cooperation Actions (SICAs) with ICPC countries in areas of mutual interest and dedicated to cooperation on topics selected on the basis of their scientific and technological competences and needs.

These SICAs have specific rules for participation. For the SICA projects there must be at least four independent legal entities of which at least two must be established in different Member States or Associated countries and at least two must be established in different ICPC countries in the target regions defined in the objective for the project.

A higher number of participants may be specified on a call-by-call basis: check the call fiche.

Financial Regime

Reimbursement will be based on eligible costs (based on maximum rates of reimbursement specified in the grant agreement for different types of activities within the project). In some cases the reimbursement of indirect costs is based on a flat rate.

The work programmes shall specify if other forms of reimbursement are to be used in the actions concerned. Participants in International Cooperation Partner countries (see Annex 1 of the Cooperation work programme) may opt for a lump sum.

Specific Characteristics

The description of work (Annex 1 to the grant agreement) is normally fixed for the duration of the project.

The composition of the consortium is normally fixed for the duration of the project.

b) Large-scale integrating projects (IP)

Purpose

Large scale integrating collaborative projects (IP) are objective-driven research projects, which aim at generating new knowledge, including new technology, or common resources for research in order to improve European competitiveness, or to address major societal needs. They have clearly defined scientific and technological objectives directed at obtaining specific results, which could be applicable in terms of development or improvement of products, processes, services or policy. As such, they may also be targeted to special groups, such as SMEs.

Large scale integrating projects have a comprehensive 'programme' approach: including a coherent integrated set of activities dealing with a range of aspects and tackling multiple issues and aimed at specific deliverables; there will be a large degree of autonomy to adapt content and partnership (all types of stakeholders) and update the work plan, where/as appropriate.

Size and resources

There must be at least three 'legal entities' established in different EU Member States or Associated countries. The entities must be independent of each other.

A higher number may be specified on a call-by-call basis: check the call fiche.

The size, scope and internal organisation of collaborative projects can vary from research theme to research theme and from topic to topic. During FP6 the number of participants in IPs for the IST priority varied between 10–20 and the total EU contribution was between EUR 4 million and EUR 25 million, with an average around EUR 10 million.

Duration

IPs are expected to last typically three to five years. However, there is no formal minimum or maximum duration.

Activities

The activities to be carried out in the context of an IP can include (indents a) and/or b) being a must):

- a) research and technological development activities, reflecting the core activities of the project, aimed at a significant advance beyond the established state-of-the-art

- b) demonstration activities, designed to prove the viability of new technologies that offer a potential economic advantage, but which cannot be commercialised directly (e.g. testing of product-like prototypes)
- c) activities to disseminate research results and to prepare for their uptake and use, including knowledge management and IPR protection
- d) management activities, over and above the technical management of individual work packages, linking together all the project components and maintaining communication with the Commission
- e) training of researchers and key staff, including research managers and industrial executives (in particular for SMEs and any potential users of the knowledge generated by the project). The training should aim to improve the professional development of the personnel concerned
- f) other activities, if required

Financial Regime

Reimbursement will be based on eligible costs (based on maximum rates of reimbursement specified in the grant agreement for different types of activities within the project). In some cases the reimbursement of indirect costs is based on a flat rate.

The work programmes shall specify if other forms of reimbursement are to be used in the actions concerned. Participants in International Cooperation Partner countries (see Annex 1 of the Cooperation work programme) may opt for a lump sum.

Specific Characteristics

A sequence of updates of the description of work (Annex 1 of the grant agreement) may be provided for in the grant agreement.

Enlargement of partnership, within the initial budget, is possible.

2. Networks of Excellence (NoE)

Support to a Joint Programme of Activities implemented by a number of research organisations integrating their activities in a given field, carried out by research teams in the framework of longer term co-operation. The implementation of this Joint Programme of Activities will require a formal commitment from the organisations integrating part of their resources and their activities.

The funding scheme will support the long-term durable integration of research resources and capacities (researchers, services, teams, organisations, institutions) in fields of strategic importance for European research, through the establishment of a single virtual centre of research, in order to overcome demonstrable, detrimental fragmentation, thus strengthening European scientific and technological excellence on a particular research topic.

Networks of Excellence will aim at consolidating or establishing European leadership at world level in their respective fields by integrating at European level the resources and expertise needed for the purpose. This will be achieved through the implementation of a Joint Programme of Activities (JPA) aimed principally at creating a progressive and durable integration of the research capacities of the network partners while at the same time advancing knowledge on the topic.

Since Networks of Excellence are aimed at tackling fragmentation of existing research capacities, they should be implemented provided that:

- research capacity is fragmented in the (thematic) area being considered;
- this fragmentation prevents Europe from being competitive at international level in that area;
- the proposed integration of research capacity will lead to higher scientific excellence and more efficient use of resources.

The implementation of the Joint Programme of Activities will require a formal commitment from the organisations integrating part or the entirety of their research capacities and activities.

The Joint Programme of Activities (JPA) is the collective vehicle for achieving the durable integration of the research resources and capacities of the Network of Excellence. In order to do so, the JPA should consist of a coherent set of integrating activities that the participants undertake jointly. The JPA will have several components:

- activities aimed at bringing about the integration of the participants research activities on the topic considered, such as:
 - establishing mechanisms for co-ordinating and eventually merging the research portfolios of the partners
 - staff exchange schemes
 - complete or partial relocation of staff
 - establishment of shared and mutually accessible research equipment, managerial and research infrastructures, facilities and services
 - exploration of the legal requirements (facilitators/barriers) for durable integration,
 - setting up of joint supervisory bodies
 - measures for joint public relations ...
- jointly executed research to support the durable integration, e.g. systemic development, or development of common tools, or at filling gaps in the collective knowledge portfolio of the network, in order to make the research facilities useable by the network. (NB: in addition to this research, participants in a network will pursue their 'own institutional portfolio', including research, development or demonstration in the area covered by the network itself. The latter research, development or demonstration activities are not part of the 'joint programme of activities' and thus will not be part of the eligible costs of the network)
- activities designed to spread excellence, such as:
 - The main component of these activities will be a joint training programme for researchers and other key staff;
 - Other spreading of excellence activities may include: dissemination and communication activities (including public awareness and understanding of science), and, more generally, networking activities to help transfer knowledge to teams external to the network.
 - Spreading of excellence may also include the promotion of the results generated by the network; in such a context, networks should, when appropriate, include innovation-related activities (protection of knowledge generated within the network, assessment of the socio-economic impact of the knowledge and

technologies used and development of a plan for dissemination and use of knowledge), as well as any appropriate gender and/or ethical related activities

- all the network's activities should be carried out within a coherent framework for the management of the consortium linking together all the project components and maintaining communications with the Commission.

3. Coordination and support actions (CSA)

Support to activities aimed at coordinating or supporting research activities and policies (networking, exchanges, trans-national access to research infrastructures, studies, conferences, etc). These actions may also be implemented by means other than calls for proposals.

The Funding Scheme allows for two types of actions to be financed: a) '*co-ordination or networking actions*', b) '*specific support actions*'.

a) Coordination or networking actions (CA)

Coordinating or networking actions will always have to be carried out by a consortium of participants, normally three from three different countries.

The coordination or networking actions cover the following activities:

the organisation of events - including conferences, meetings, workshops or seminars -, related studies, exchanges of personnel, exchange and dissemination of good practices, and, if necessary, the definition, organisation and management of joint or common initiatives together of course with management of the action.

The coordination and networking actions normally stretches over a longer period.

b) Specific support actions (SA)

Specific support actions may be carried out by a single participant, which can be based in any member state, associated country or a third country. Therefore there are no restrictions on the size of the consortium.

Although normally awarded following calls for proposals, there are also the possibilities to award specific support actions through public procurement carried out on behalf of the EU or to grant support to legal entities identified in the Specific Programmes or in the work programmes where the Specific Programme permits the work programmes to identify beneficiaries.

The objective of specific support actions are to contribute to the implementation of the Framework Programmes and the preparation of future EU research and technological development policy or the development of synergies with other policies, or to stimulate, encourage and facilitate the participation of SMEs, civil society organisations and their networks, small research teams and newly developed or remote research centres in the activities of the thematic areas of the Cooperation programme, or for setting up of research-intensive clusters across the EU regions.

The specific support actions can be of different types covering different activities:

- monitoring and assessment activities, conferences, seminars, studies, expert groups, high level scientific awards and competitions, operational support and dissemination, information and communication activities, support for transnational access to research infrastructures or preparatory technical work, including feasibility studies, for the development of new infrastructures, support for cooperation with other European research schemes, the use by the Commission of external experts, management or a combination of these.

4. Combination of Collaborative Projects and Coordination and Support Actions (CP-CSA)

CP-CSA involves a combination of the collaborative projects and coordination and support actions (CP-CSA) funding schemes. It enables therefore the financing, under the same grant agreement, of research, coordination and support activities.

In this Work Programme, CP-CSAs for Pre-Commercial Procurement (PCP) will combine, in a closely co-ordinated manner:

- Networking and coordination activities: for public bodies in Europe to cooperate in the innovation of their public services through a strategy that includes PCP.
- Joint research activities: related to validating the PCP strategy jointly defined by the public bodies participating in the action. This includes the exploration, through a joint PCP, of possible solutions for the targeted improvements in public sector services, and the testing of these solutions against a set of jointly defined performance criteria for addressing a concrete, shared public sector purchasing need.

The two categories of activities are mandatory due to the synergistic effects between the two components.

Appendix 3: Coordination of national or regional research programmes

The objective of these actions is to step up the cooperation and coordination of research programmes carried out at national or regional level in the Member or Associated States through the networking of research programmes, towards their mutual opening and the development and implementation of joint activities.

Under FP7 the coordination of national or research programmes is continued and reinforced.

Coordination projects can network four types of activities: (1) Information exchange – (2) Definition and preparation of joint activities – (3) Implementation of joint activities – (4) Funding of joint trans-national research actions:

- **ERA-NETs** and other coordination actions launched under FP6 wishing to submit a follow-up proposal under FP7 have to propose a strong coordination action focusing directly on steps three and four, in order to achieve mutual opening and trans-national research via joint/common calls, joint/common programmes or, if appropriate, other joint trans-national actions. New coordination actions, which address new topics and without any experience from FP6, should address at least the first three steps, but are encouraged to aim at the 'four step approach', as described above.
- Under **ERA-NET Plus actions**, the Commission provides an incentive to the organisation of joint calls between national or regional research programmes by 'topping-up' joint trans-national funding with EU funding. These joint calls will entail the award of grants to third parties participating in calls for proposals launched under the ERA-NET Plus actions. These actions require programme owners or programme managers from at least 5 different Member or Associated States to plan a single joint call with a clear financial commitment from the participating national or regional research programmes. Full details of the ERA-NET Plus scheme are given in Annex 4 of the Cooperation work programme.

Appendix 4: Distribution of indicative budget commitment

Indicative budget for the ICT Theme (2013)¹¹⁰

	2013 (in EUR)
<i>Calls for proposals</i>	
ICT Call 10	705.500.000
ICT Call 11	236.500.000
PPP Cross-Thematic Call - Factories of the Future – 2013	70.000.000
PPP Cross-Thematic Call - Green Cars – 2013	40.000.000
SMART Cities co-ordinated Call	95.000.000
PPP Future Internet – 2013	130.000.000
FET Flagship Initiatives	108.000.000
FET Open	50.000.000
FET Open Xtrack	15.000.000
ICT – EU Brazil	5.000.000
ICT – EU Japan	9.000.000
SME initiative on Digital Content and Languages	20.000.000
<i>Other expenditures</i>	
Independent experts assisting in proposal evaluations and project reviews	15.000.000
Studies	6.000.000
Publications and communication activities and event support	2.000.000
HFSP	1.869.000
IMS secretariat	140.000
AAL Joint National Programme ¹¹¹	25.000.000
<i>ICT Contribution to General FP7 Activities¹¹²</i>	
COST	11.287.640
Experts (evaluators and reviewers) related with horizontal activities	26.851
CORDIS	2.121.213
EUREKA	107.403

¹¹⁰ Under the condition that the draft Budget 2013 is adopted without modification by the Budgetary Authority

¹¹¹ Joint research and development programme aimed at enhancing the quality of life of older people through the use of new information and communication technologies, cf. Decision No 742/2008/EC. The EU financial contribution to the implementation of the AAL JP is implemented through annual financing agreements which sets out in detail the planned topics for call for tenders and calls for proposals and the associated financial commitments by participating countries as a condition for the EU co-financing. See <http://www.aal-europe.eu>

¹¹² These are specified in Annex 4 to the work programme under Activities A4.1 (CORDIS), A4.2.2.3 (ERA-NET Thematic Coordination Actions), A4.4 (EUREKA) and A4.5 (COST).

Total	1.547.552.107
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Appendix 5: FET eligibility and evaluation criteria

Additional eligibility criteria applicable to FET-Open Objectives ICT-2013.9.1, ICT-2013.9.2, ICT-2013.9.3 and ICT-2013.9.4

In addition to the eligibility criteria set out in Annex 2 to this work programme, all FET-Open short proposals submitted under objectives ICT-2013.9.1, ICT-2013.9.2 and ICT-2013.9.3 are subject to the following eligibility criteria:

1. Part B should not exceed 5 A4 pages, excluding a single title page with acronym, title and abstract of the proposal;
2. Part B of a short STREP proposal should be fully anonymous, meaning that it may not include the name of any organisation or its staff involved in the consortium or any other information which could identify an applicant. Furthermore, strictly no bibliographic references or any other link to additional information are permitted.

Proposals (short and full) submitted to FET-Open Objective ICT-2013.9.2: High-Tech Research Intensive SMEs in FET research are subject to the following additional eligibility criteria:

3. The consortium must contain at least one SME.¹¹³

Proposals (short and full) submitted to FET-Open Objective ICT-2013.9.3: FET Young Explorers are subject to the following additional eligibility criteria:

4. A project must be led by a young researcher, and the leadership by young researchers of all work packages is also required. No more than six years should have elapsed between the award of a Ph.D. (or equivalent) for each such young researcher and the date of submission of the short proposal.¹¹⁴

Proposals submitted to FET-Open Objective ICT-2013.9.4: International cooperation on FET research are subject to the following additional eligibility criteria:

5. Proposals must be presented by the coordinator of an on-going FET¹¹⁵ IP or STREP project ending at least 18 months after the submission date of the proposal.

Additional eligibility criteria applicable to FET-Open Objective ICT-2013.9.5

In addition to the eligibility criteria set out in Annex 2 to this work programme, all FET-Open proposals submitted under objectives ICT-2013.9.5 are subject to the following eligibility criteria:

¹¹³ An SME is an enterprise which has fewer than 250 employees, has an annual turnover not exceeding 50 million EUR, and/or has an annual balance-sheet total not exceeding 43 million EUR. Possible relationships with other enterprises must be taken into account when calculating these data of the enterprise. Research centres, research institutes, contract research organisations or consultancy firms are not eligible SMEs for the purpose of the Co-operative and Collective schemes.

¹¹⁴ Extensions of this period may be allowed only in case of eligible career breaks which must be properly documented: maternity (18 months per child born after the PhD award) & paternity leave (accumulation of actual time off for children born after the PhD award) and leave taken for long-term illness, national service.

¹¹⁵ Ongoing projects selected under any of the FET objectives of the FP7 ICT Work Programmes.

1. Part B (sections 1, 2 and 3) should not exceed 10 A4 pages, excluding section 4 and a single title page with acronym, title and abstract of the proposal. Section lengths should respect the following limitations:
 - The length of Section 1 (S&T Quality) is maximally 8 A4 pages;
 - The length of Section 2 (Implementation) is maximally 1 A4 page;
 - The length of Section 3 (Impact) is maximally 1 A4 page
2. The title page and Section 1 of Part B should be fully anonymous, meaning that it may not include the name of any organisation or its staff involved in the consortium or any other information which could identify an applicant. Furthermore, on the title page and in Section 1 strictly no bibliographic references or links to additional information are permitted.

FET Evaluation criteria

Eligible proposals under the FET objectives will be evaluated according to three criteria - Scientific/Technological Quality, Implementation and Impact. A score will be awarded for each of these criteria, based on the considerations listed below. For FET-Open short proposals submitted under objectives ICT-2013.9.1, ICT-2013.9.2 and ICT-2013.9.3 only Scientific/technological Quality applies. Specific evaluation criteria are applicable to FET-Open Objective ICT-2013.9.5.

	<i>1. S/T quality</i>	<i>2. Implementation</i>	<i>3. Impact</i>
short STREP (FET Open) Objective 9.1, 9.2 and 9.3	<ul style="list-style-type: none"> • Clarity of targeted breakthrough and its relevance towards a long-term vision. • Novelty and foundational character. • Plausibility of the S/T approach. 	<i>(not applicable to short STREP)</i>	<i>(not applicable to short STREP)</i>
	Threshold: 4/5		
Collaborative Projects (FET Open¹¹⁶ and FET Proactive, STREPs and IPs)	<ul style="list-style-type: none"> • Clarity of targeted breakthrough and its relevance towards a long-term vision. • Novelty and foundational character. • Specific contribution to progress in science and technology. • Quality and effectiveness of the S/T methodology. 	<ul style="list-style-type: none"> • Quality of workplan and management. • Quality and relevant experience of the individual participants. • Quality of the consortium as a whole (including complementarity, balance). • Appropriate allocation and justification of the resources to be committed (person-months, equipment, budget). 	<ul style="list-style-type: none"> • Transformational impact of the results on science, technology and/or society. • Impact towards the targeted objective in the workprogramme. • Appropriateness of measures envisaged for the dissemination and/or use of project results.
	Threshold: 4/5	Threshold: 3/5	Threshold: STREP 3.5/5
	Weight: 50%	Weight: 20%	IP 4/5 Weight: 30%

¹¹⁶ Not applicable to FET-Open Objective ICT-2013.9.5.

Coordination and Support Actions (FET Open and FET Proactive)	<ul style="list-style-type: none"> • Clarity of objectives. • Contribution to the co-ordination and/or support of high-risk and high-impact research, for new or emerging areas or horizontally. • Quality and effectiveness of the coordination and/or support activities. 	<ul style="list-style-type: none"> • Quality of workplan and management. • Quality and relevant experience of the individual participants. • Quality of the consortium. • Appropriate management of the resources to be committed (person-months equipment, budget). 	<ul style="list-style-type: none"> • Transformational impact on the communities and/or practices for high-risk and high-impact research. • Appropriateness of measures for spreading excellence, use of results, and dissemination of knowledge, including engagement with stakeholders.
	Threshold: 3/5 Weight: 40%	Threshold: 3/5 Weight: 20%	Threshold: 3/5 Weight: 40%

Specific evaluation criteria applicable to FET-Open Objective ICT-2013.9.5

Eligible proposals under this FET objective will be evaluated in two steps. In a first step the anonymous section 1 of part B of an eligible proposal will be evaluated only on Scientific/technological quality criteria. In a second step, only the proposals scoring above threshold on the Scientific/technological quality criteria will be evaluated on Implementation and on Impact. Scores are awarded per criteria, based on the considerations listed below.

	1. S/T quality	2. Implementation	3. Impact
Collaborative Projects (FET-Open Objective ICT-2013.9.5 - STREPs)	<ul style="list-style-type: none"> • Clarity of targeted breakthrough and its relevance towards a long-term vision. • Novelty and foundational character. • Specific contribution to progress in science and technology. • Quality and effectiveness of the S/T methodology and workplan. 	<ul style="list-style-type: none"> • Quality of management. • Quality of the participants and of the consortium as a whole. • Appropriate allocation and justification of resources (person-months, equipment, budget). 	<ul style="list-style-type: none"> • Appropriateness of measures envisaged towards getting a transformational impact of the results on science, technology and/or society. • Appropriateness of measures envisaged for the dissemination and/or use of project results.
	Threshold: 4/5 Weight: 80%	Threshold: 3/5 Weight: 10%	Threshold: 3.5/5 Weight: 10%

Thresholds are set for each criterion, as indicated in the tables above. A proposal failing to achieve any of these threshold scores will be rejected.

Priority order for proposals with the same score

As part of the evaluation by independent experts, a panel review will recommend one or more ranked lists for the proposals under evaluation, following the scoring systems indicated above. A ranked list will be drawn up for every indicative budget shown in the call fiche.

If necessary, the panel will determine a priority order for proposals which have been awarded the same score within a ranked list. Whether or not such a prioritisation is carried out will depend on the available budget or other conditions set out in the call fiche. The following

approach will be applied successively for every group of *ex aequo* proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

Proposals will be prioritised according to the scores they have been awarded for the criterion *scientific and/or technological excellence*. When these scores are equal, priority will be based on scores for the criterion *impact*. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme.

Specific Evaluation criteria for the Objective ICT-2013.9.9 FET Flagships

Eligible proposals under the FET Flagships call will be evaluated according to three criteria - Scientific/Technological Quality, Implementation and Impact. A score will be awarded for each of these criteria, based on the aspects listed below.

	Sub-criteria
<p>Criterion 1 S/T quality Weight: 50% Threshold: 4/5</p>	<ul style="list-style-type: none"> • Degree of adherence to the Flagship concept as specified in the work programme • Soundness of scientific concept, quality of objectives and progress beyond the state-of-the-art • Quality and effectiveness of the strategic research roadmap, the associated workplan (including milestones, flexibility and metrics to monitor progress), and the resources available to achieve them • Quality and effectiveness of the coordination of activities and research communities
<p>Criterion 2 Implementation Weight: 20% Threshold: 3/5</p>	<ul style="list-style-type: none"> • Quality of the governance, including management procedures and risk management • Quality and relevant experience of the individual participants, and their contribution to the common goal • Quality of the core project consortium as a whole (including complementarity, balance) • Openness and flexibility of the Partnership and involvement of key actors • Appropriateness of the allocation and justification of the resources to be committed (e.g. in-kind contributions, infrastructures, person-months, equipment and budget)
<p>Criterion 3 Impact Weight: 30% Threshold: 4/5</p>	<ul style="list-style-type: none"> • Contribution to the expected impacts listed in the work programme at the European and global level • Extent to which the proposal makes use of complementarities, exploits synergies, and enhance the overall outcome of regional, national, European and international research programmes • Quality of measures for use of results, management of intellectual property and dissemination of knowledge • Impact on human capital, education and training at European level • Approach to address social benefit and potential ethical and legal implications, including engagement with authorities and end-users

Thresholds are set for each criterion, as indicated in the tables above. A proposal failing to achieve any of these threshold scores will be rejected.

Priority order for proposals with the same score

As part of the evaluation by independent experts, a panel review will recommend a ranked list of the proposals under evaluation, following the scoring system indicated above.

If necessary, the panel will determine a priority order for proposals which have been awarded the same score within a ranked list. Whether or not such a prioritisation is carried out will depend on the available budget or other conditions set out in the call fiche. The following approach will be applied successively for every group of *ex aequo* proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

Proposals will be prioritised according to the scores they have been awarded for the criterion *scientific and/or technological excellence*. When these scores are equal, priority will be based on scores for the criterion *impact*. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme.

- Indicative evaluation and contractual timetable: It is expected that the grant agreement negotiations for the shortlisted proposals will start as of January/February 2013.
- Consortia agreements: Participants in all actions resulting from this call are required to conclude a consortium agreement.
- The forms of grant which will be offered are specified in Annex 3 to the Cooperation work programme.

Appendix 6: Specific Requirements for the implementation of Pre-Commercial Procurement (PCP)

The following requirements are applicable to PCP calls for tender launched under actions requiring PCP to ensure that the conditions for the Article 16f/24e exemption of the public procurement directives¹¹⁷ are respected, that the risk-benefit sharing in PCP takes place according to market conditions and that the Treaty principles¹¹⁸ and competition rules are fully respected throughout the PCP process:

– The consortium of public purchasers should verify that the topic proposed for the joint PCP call for tender would **fit the scope of an R&D¹¹⁹ services contract**. During the preparation

¹¹⁷ Directives 2004/18/EC and 2004/17/EC.

¹¹⁸ In particular the fundamental Treaty principles on the free movement of goods, the free movement of workers, the freedom to provide services, the freedom of establishment and the free movement of capital, as well as the principles deriving there from, such as the principles of non-discrimination, transparency and equal treatment

¹¹⁹ R&D can cover activities such as solution exploration and design, prototyping, up to the original development of a limited volume of first products or services in the form of a test series. Original development of a first product or service may include limited production or supply in order to incorporate the results of field testing and to demonstrate that the product or service is suitable for production or supply in quantity to acceptable quality standards. R&D does not include commercial development activities such as quantity production, supply to establish commercial viability or to recover R&D costs, integration, customisation, incremental adaptations and improvements to existing products or processes.

phase of the PCP call for tender, the consortium should encourage an open dialogue¹²⁰ with potential tenderers and end-users to broach the views of the market about the R&D scope of the PCP. Regarding scope, PCP only covers the procurement of R&D services, in a way that is clearly separated from any potential subsequent purchases of large volumes of end-products (ref COM/2007/799). Participation to a PCP action therefore does not commit participating public purchasers to subsequent procurement of large volumes of end-products resulting from a PCP. Public purchasers undertaking a PCP can if they so desire, but are not obliged to, procure at market price R&D results resulting from a PCP (e.g. limited set of prototypes or test series products/services that were developed during a PCP¹²¹)."

– **The practical set-up foreseen for the PCP** shall be clearly announced in the PCP contract notice. This shall include the intention to select multiple companies to start the pre-commercial procurement in parallel, as well as the number of phases and the expected duration of each phase.

– **Functional specifications** shall be used in order to formulate the object of the PCP tender as a problem to be solved without prescribing a specific solution approach to be followed.

– In view of triggering tenderers to send in innovative offers that include R&D that can bring breakthrough improvements to the quality and efficiency of public services, the selection of offers shall not be based on lowest price only. The PCP contracts shall be awarded to the tenders offering **best value for money**, that is to say, to the tender offering the best price-quality ratio, while taking care to avoid any conflict of interests¹²². In case public purchasers use external experts to assist e.g. in the preparation of the PCP call for tender or in the evaluation of offers, they should ensure that these are independent experts.

– In respect of the Treaty principles the public purchasers shall ensure **EU wide publication** for the PCP call for tender¹²³; in at least English, shall accept offers and enable communication with stakeholders at all stages throughout the PCP project in at least English, and shall evaluate all offers according to the same objective criteria regardless of the geographic location of company head offices, company size or governance structure. The PCP process should require participating companies to locate the majority of the R&D and operational activities related to the PCP contract, including in particular the principal researcher(s) working for the PCP contract, in the Member States or Associated Countries. Subcontracting of R&D work by companies/consortia participating in a PCP to other third parties should be limited. Companies/consortia participating in a PCP should pass on to any of their

¹²⁰ The open dialogue should be organised in a way not to preclude or distort competition. In respect of the Treaty principles, the open dialogue should be announced widely and well in advance and enable companies regardless of the geographic location to participate to the dialogue at least in English. All information given in answers to questions from participants in the dialogue should be documented and published.

¹²¹ Contracts providing more than only services are still considered a public service contract if the value of the services exceeds that of the products covered by the contract.
Art. 31(2)(a) resp. Art. 40(3)(b) of public procurement directives 2004/18/EC resp. 2004/17/EC.

¹²² For more info refer to Staff Working Document on PCP: SEC (1668) 2007

¹²³ Through the Official Journal of the European Union (OJEU), using the TED (Tenders Electronic Daily) web portal

subcontractors the obligation to respect the rights assigned in PCP projects to the public purchasers and the EC that are financially supporting the PCP."

– In PCP, the public purchaser does not reserve the R&D results exclusively for its own use. To ensure that such an arrangement is beneficial both for the public purchaser and for the companies involved in PCP, **R&D risks and benefits are shared** between them in such a way that both parties have an incentive to pursue wide commercialisation and take up of the new solutions. Therefore, for PCP, ownership rights of **IPRs** generated by a company during the PCP contract should be assigned to that company. The public purchasers should be assigned a free licence to use the R&D results for internal use as well as the right to require participating companies to license IPRs to third parties under fair and reasonable market conditions. A call-back provision should ensure that IPRs from companies that do not succeed to exploit the IPRs themselves within a given period after the PCP project return back to the public purchasers. The public purchasers should inform participating companies of their right to publish - after consultation with each participating company - public summaries of the results of the PCP project, including information about key R&D results attained and lessons learnt by the public purchaser during the PCP (e.g. on the feasibility of the explored solution approaches to meet the purchasers' requirements and lessons learnt for potential future deployment of solutions). Details should not be disclosed that would hinder application of the law, would be contrary to the public interest, would harm the legitimate business interests of the companies involved in the PCP (e.g. regarding IPR protected specificities of their individual solution approaches) or could distort fair competition between the participating companies or others on the market.

– In order to enable the public purchasers to **establish the correct (best value for money) market price for the R&D service, in which case the presence of State aid can in principle be excluded** according to the definition contained in Art. 107 of the Treaty on the functioning of the European Union, the distribution of rights and obligations between public purchasers and companies participating in the PCP, including the allocation of IPRs, shall be published upfront in the PCP call for tender documents and the PCP call for tender shall be carried out in a competitive and transparent way in line with the Treaty principles which leads to a price according to market conditions, and does not involve any indication of manipulation. The consortium of public purchasers should ensure that the PCP contracts with participating companies contain a financial compensation according to market conditions¹²⁴ compared to exclusive development price for assigning IPR ownership rights to participating companies, in order for the PCP call for tender not to involve State aid.

– The PCP contract that will be concluded with each selected organisation shall take the form of **one single framework contract covering all the PCP phases**, in which the distribution of rights and obligations of the parties is published upfront in the tender documents and which does not involve contract renegotiations on rights and obligations taking place after the choice of participating organisations. This framework contract shall contain an agreement on the future procedure for implementing the different phases (through specific contracts), including the format of the intermediate evaluations after the solution design and prototype development stages that progressively select organisations with the best competing solutions.

¹²⁴ The financial compensation compared to exclusive development cost should reflect the market value of the benefits received and the risks assumed by the participating company. In case of IPR sharing in PCP, the market price of the benefits should reflect the commercialisation opportunities opened up by the IPRs to the company, the associated risks assumed by the company comprise for instance the cost carried by the company for maintaining the IPRs and commercialising the products.

-□ In order to remove unnecessary barriers for innovative new companies, typically SMEs, to make offers for the PCP call for tender, consortia should avoid the use of selection criteria based on stringent qualification requirements and disproportionate financial guarantee requirements (e.g. with regards to prior customer references and minimum turnover). As an alternative, the commercialisation plan can be a factor in the evaluation criteria used along the PCP process, requiring participating companies to demonstrate that they are able to build up - gradually throughout the PCP process - sufficient financial capacity¹²⁵ to successfully commercialise the solutions developed during the PCP.

¹²⁵ e.g. by requiring in the later PCP phases proof of support of an external financial investor such as a Venture Capitalist, or the commitment of a first buyer – e.g. a public procurer – to make a follow-up investment in the solutions developed during the PCP (e.g. to further scale up the production chain to large scale production and/or deploy a first batch of commercial end-solutions once successfully tested at the end of the PCP).

Glossary

3D	Three Dimensional
AAL	Ambient Assisted Living
API	Application Programming Interface
ARTEMIS	Advanced Research & Technology for Embedded Intelligence & Systems
Associated Countries	See Section 3 of the 'Guide for Applicants'
ACP	Africa, Caribbean, Pacific
BNCI	Brain-Neural Computer Interfaces
CA	Coordination action
CAD	Computer Aided Design
CAE	Computer Aided Engineering
Call for Proposals	As published in the Official Journal. Opens parts of the workprogramme for proposals, indicating what types of actions (RTD projects, Accompanying actions etc.) are required. A provisional timetable for such calls is included in the workprogramme
CAS	Collective Adaptive Systems
CFD	Computational fluid dynamics
CIP	Competitiveness and Innovation Programme (http://ec.europa.eu/enterprise/enterprise_policy/cip/index_en.htm)
CMOS	Complementary metal-oxide semiconductor
COST	COST supports co-operation among scientists and researchers across Europe http://www.cost.esf.org/
COTS	Components off the shelf
CRI	Colour Rendering Index
CSA	Coordination and Support Action
CSS	Complex Systems Science
DNA	Deoxyribonucleic acid
EHR	
EIB	European Investment Bank
EIROForum	Partnership of Europe's seven largest intergovernmental research organisations (http://www.eiroforum.org/)
EMI-EMC	Electromagnetic Interference/Electromagnetic Compatibility
EMF	Electromagnetic Fields
ENIAC	European Nanoelectronics Initiative Advisory Council
ERA	European Research Area
ERA-NET	European Research Area Network
ESCO	Energy Service Company
ETP	European Technology Platform http://cordis.europa.eu/technology-platforms/home_en.html
EU	European Union

EUREKA	A Europe-wide Network for Industrial RTD (www.eureka.be)
Eurostars	European innovation programme managed by EUREKA, to provide funding for market-oriented research and development specifically with the active participation of R&D-performing small and medium-sized enterprises (http://www.eurostars-eureka.eu/)
Evaluation	The process by which proposals are retained with a view to selection as projects, or are not retained Evaluation is conducted through the application of Evaluation Criteria identified in the Workprogramme.
EWSP	European Wide Service Platform
FET	Future and Emerging Technologies
FEV	Full Electric Vehicle
FI-PPP	Future Internet PPP
FIRE	Future Internet Research and Experimentation
FoF	Factory of the Future
FP	Framework Programme (EU – Seventh FP is FP7, etc. – cordis.europa.eu)
FPGA	Field-Programmable Gate Array
GEANT	Pan-European Data Network (http://www.geant.net/)
GHG	Greenhouse Gas
GPU	Graphics Processing Unit
HD	High Definition
HFSP	Human Frontier Science Program (www.hfsp.org)
HPC	High Performance Computing
ICPC	International Cooperation Partner Countries (see list in Annex 1 to the Cooperation Work Programme)
ICT	Information and communications technologies
ICTC	Information and Communication Technologies Committee
IMS	Intelligent Manufacturing Systems Initiative (http://www.ims.org/)
IoT	Internet of Things
IP	Large-scale integrating project
IP	Internet Protocol
IPR	Intellectual Property Rights
Ipv6	Internet Protocol Version 6
IST	Information Society Technologies (FP6 programme)
ISTAG	Information Society Technologies Advisory Group
ITRS	International Technology Roadmap for Semiconductors
IWRM	Integrated water resources management
JTI	Joint Technology Initiative
LED	Light Emitting Diode
LTE	Long Term Evolution (4th Generation Mobile Networks)
MNBS	Micro-Nano Bio Systems
NoE	Network of Excellence

NREN	National Research and Education Network
OECD	Organisation for Economic Cooperation and Development
OFDM	Orthogonal Frequency Division Multiplexing
OLAE	Organic photonics technologies such as OLEDs (Organic Light-Emitting Diode) or OPVs (Organic Photovoltaics)
OLED	Organic Light Emitting Diode
OPV	Organic Photovoltaic
P2P	Peer to peer
PCP	Pre-Commercial Procurement
PGS	Patient Guidance System
PHR	Patient Health Record
PHS	Personal Health System
PIC	Photonic integrated circuits
PPP	Public-Private Partnership
QIPC	Quantum information processing and communication
QoS	Quality of Service
R2V	Road-to-Vehicle
RES	Renewable Energy Systems
RF	Radio Frequency
RFID	Radio Frequency Identification
RTD	Research and Technology Development.
SDK	Software Development Kit
SiC	Silicon Carbide
SICA	Specific International Cooperation Actions
SA	Specific Support Actions
SME	Small or Medium Enterprise
SoS	System of Systems
STREPs	Small or medium scale focused research action
V2G	Vehicle-to-Grid
V2I	Vehicle-to-Infrastructure
V2V	Vehicle-to-Vehicle
VPH	Virtual Physiological Human
VR	Virtual Reality
WDM	Wave-length Division Multiplexing

GENERAL ANNEXES

General Introduction

Annex 1: International Cooperation Partner Countries (ICPC)

Annex 2: Eligibility and Evaluation Criteria for Proposals

Annex 3: Forms of grant and maximum reimbursement rates for projects funded through the Cooperation Work Programme

Annex 4: General Activities

In this annex, the activities which are funded across the Programme are presented. These activities concern in particular the following:

Dissemination, knowledge transfer and broader engagement

1. The CORDIS services

Co-ordination of non-Community research programmes

2. The horizontal ERA-NET scheme
3. Research organisations in the EU
4. Strengthened coordination with EUREKA
5. Scientific and technological cooperation activities carried out in COST

Annex 5: Recovery Package - Public-Private Partnership Initiatives

Annex 5 brings together for easy reference all the WP2013 topics of the three Public-Private-Partnerships (PPP) from the different participating Themes: NMP, ICT, Transport, Environment and Energy.

The three PPPs are:

- Factories of the Future (FoF)
- Energy-efficient Buildings (EeB)
- Green cars (GC)

Details of these Annexes are available at:
<http://ec.europa.eu/research/participants/portal>

WORK PROGRAMME 2013

COOPERATION

THEME 4

***NANOSCIENCES, NANOTECHNOLOGIES, MATERIALS AND
NEW PRODUCTION TECHNOLOGIES - NMP***

(European Commission C(2012) 4536 of 09 July 2012)

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Objective: Improve the competitiveness of European industry and generate knowledge to ensure its transformation from a resource-intensive to a knowledge-intensive industry, by generating step changes in knowledge and implementing decisive knowledge for new applications at the crossroads between different technologies and disciplines. This will benefit both new, high-tech industries and higher-value, knowledge-based traditional industries, with a special focus to the appropriate dissemination of RTD results to SMEs. These activities are primarily concerned with enabling technologies which impact all industrial sectors and many other Seventh Framework Programme themes.

I. CONTEXT

Against the backdrop of the current economic situation and increased global competition, the Union has defined a strategy to support growth and job creation, Europe 2020. The Innovation Union Flagship initiative supports this strategy through specific commitments. Research and innovation are key drivers of competitiveness, jobs, sustainable growth and social progress.

The work programme 2013 aligns with, and contributes towards, the objectives of Europe 2020, the **Innovation Union** Flagship¹, and other EU policies. There is a determined focus on fostering new ideas, supporting world class teams tackling significant societal challenges, and on ensuring that the fruits of our investments can be properly exploited.

In this way the work programme provides for a smooth transition towards the new research and innovation programme for 2014-2020, Horizon 2020.

I.1 Approach for 2013

Europe 2020 and the Innovation Union flagship stress the need for growth and the focus on societal challenges, which will be the basis for jobs and wealth creation in Europe.

There are more than 20 million active enterprises in the EU-27, of which a third are active in the manufacturing sectors (including construction). In terms of wealth creation, manufacturing and construction generate around a quarter of the total EU-27 added value and provide around 50 million jobs; however, they are facing growing competition.

In a few words, the NMP Theme focuses on smart and sustainable growth, for a greener industry, its three constituent activities being the tools rather than ends in themselves.

It covers the entire range of industrial research activities. Its central objective is to support the transformation of European industry from a resource-intensive (relying on raw materials, labour, energy etc.) to a knowledge-intensive and sustainable industry. The issue for growth and employment is how industry can incorporate knowledge into products with high added value, and highly efficient processes. Sustainability and societal challenges have always been implicit in NMP strategies, but are receiving increased attention.

Activities under the NMP Theme in the last year of FP7 represent a natural continuation of those in 2012, in line with the multi-annual plans prepared in consultation with key stakeholders. Calls of the NMP Theme in 2013 will continue to span the spectrum from enabling research, to applications and demonstration activities. There is a continued emphasis on applications including demonstration, in order to support the goals of the Innovation Union.

¹ COM(2010)546

A key feature of the 2013 work programme (WP) is the participation for the fourth year in actions within the European recovery package. Starting with the WP 2010, the NMP Theme supports the **European Economic Recovery Plan**, through three **Public-Private Partnerships** (PPPs): 'Factories of the future', 'Energy efficient Buildings' and 'Green Cars'.

The development of this work programme benefited from many different inputs, such as those of the NMP Expert Advisory Group and the European Technology Platforms. Inputs from other FP7 Themes and policy needs have also been taken into account, as have the results of studies, workshops and surveys carried out in the last years. The role of the Programme Committee (NMP configuration) is also acknowledged.

This work programme contributes to the following priorities:

Oceans of the future

OCEAN.2013-1	Biosensors for real time monitoring of biohazard and man-made chemical contaminants in the marine environment
OCEAN.2013-3	Innovative antifouling materials for maritime applications

Raw materials

4.1-1	Development of new materials for the substitution of critical metals – coordinated call with the Japan Science and Technology Agency
4.1-2	Breakthrough Solutions for Mineral Extraction and Processing in Extreme Environments
4.1-3	European Intelligence Network on the Supply of Raw Materials

Smart cities

EeB-1	Nanotechnology for multifunctional lightweight construction materials and components
EeB-2	Safe, energy-efficient and affordable new eco-innovative materials for building envelopes and/or partitions to provide a healthier indoor environment
EeB-3	Integration of technologies for energy-efficient solutions in the renovation of public buildings
EeB-4	Integrated control systems and methodologies to monitor and improve building energy performance
EeB-5	Optimised design methodologies for energy-efficient buildings integrated in the neighbourhood energy systems
EeB-6	Achieving high efficiency by deep retrofitting in the case of commercial buildings

Water

1.2-1	Nanotechnology-based sensors for environmental monitoring
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Anti-microbial resistance

1.2-2	Nanotherapeutics to treat bacterial infectious diseases
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I.2 Research for industrial innovation and SMEs

This work programme contains **innovation measures** in support of activities closer to the market. These include the up-scaling of laboratory-based processes and other, pilot-scale activities; and also a range of demonstration activities, such as pilot implementation in

industrial settings, and technical and economic reviews of the new technology. These appear principally in the following topics:

1.1-1	Exploration, optimisation and control of nano-catalytic processes for energy applications
2.1-1	Developing new precursors, new processing routes and functionalisations for carbon fibres
2.2-1	Biomaterials for Advanced Therapies and Medical Devices in the neurological/neuromuscular or cardiovascular fields
2.2-3	Wide band gap semiconductor materials and structures for power electronics in energy technologies
3.0-2	Integrated processing and Control Systems for Sustainable Production in Farms and Forests
4.0-2	Innovative materials for efficient, stable and cheap organic photovoltaic cells
4.1-2	Breakthrough Solutions for Mineral Extraction and Processing in Extreme Environments
OCEAN.2013-1	Biosensors for real time monitoring of biohazard and man made chemical contaminants in the marine environment
OCEAN.2013-3	Innovative antifouling materials for maritime applications
FoF-1	Improved use of renewable resources at factory level
FoF-2	Innovative re-use of modular equipment based on integrated factory design
FoF-6	Mini-factories for customised products using local flexible production
FoF-7	New hybrid production systems in advanced factory environments based on new human-robot interactive cooperation
FoF-8	Innovative strategies for renovation and repair in manufacturing systems
FoF-10	Manufacturing processes for products made of composites or engineered metallic materials
FoF-11	Manufacturing of highly miniaturised components
EeB-1	Nanotechnology for multifunctional lightweight construction materials and components
EeB-2	Safe, energy-efficient and affordable new eco-innovative materials for building envelopes and/or partitions to provide a healthier indoor environment
EeB-3	Integration of technologies for energy-efficient solutions in the renovation of public buildings
EeB-4	Integrated control systems and methodologies to monitor and improve building energy performance
GC-1	Improved materials for innovative ageing resistant batteries

The work programme also addresses further issues closely related to innovation: safety and regulation; IPR; standardisation; the availability of skilled workforces; substitution of critical raw materials; and support for technology transfer.

The increasing emphasis placed on innovation-related activities is reflected in the proportion of the budget dedicated in this work programme to Large, DEMO- and SME-targeted collaborative projects, about two thirds of the total. For the same reason, the allocation of budget per topic to large collaborative projects (used for application-oriented topics) was increased starting with the WP 2012 – from EUR 15 million to EUR 18 million per topic *on average*.

The NMP theme pays particular attention to the involvement of industry, through its direct

participation in projects (which has increased from 35% in FP6 to 40% in FP7), as well as more general and strategic interactions, in particular with the European Technology Platforms. It ensures that innovation issues are properly addressed.

SME-relevant research

The participation of SMEs has been strongly encouraged in the FP7 NMP Theme, by using SME-targeted collaborative projects and appropriate topics. The SME participation is currently around 23% in budgetary terms, in projects funded under the NMP Theme.

In the work programme 2013, the budget for SME-targeted projects alone is 15% of the total (see details in section I.6 below). The following SME-targeted topics have been developed with the aim of reinforcing the S&T base of SMEs and validating innovative solutions:

2.2-1	Biomaterials for Advanced Therapies and Medical Devices in the neurological/neuromuscular or cardiovascular fields
3.0-2	Integrated processing and Control Systems for Sustainable Production in Farms and Forests
4.0-3	From research to innovation: substantial steps forward in the industrial use of European intellectual assets, stimulating the use of newly developed materials and materials technologies by the industry
FoF-11	Manufacturing of highly miniaturised components

Strengthening the European Research Area

The explicit contribution of this work programme to the European Research Area (ERA), as well as to innovation, is an ERA-NET to support Innovation in the NMP thematic area (topic NMP.2013.4.0-7). Support for the clustering activities of projects is a further contribution to the ERA (topic NMP.2013.4.0-4).

Dissemination and exploitation actions

The NMP Theme aims to enhance the use of project results. The **NMP Innovation Platform**² provides external assistance through the 'Exploitation Strategy and Innovation Consultants' (ESIC2) service. This helps identify and address possible obstacles in the exploitation of the intended results through exploitation strategy seminars. It is being extended to include support for **business plan development, patenting** (to complement the IPR Helpdesk) and **standardisation**.

I.3 Bridging with Horizon 2020

The continued emphasis on applications including demonstration provides a natural bridge to Horizon 2020 Framework Programme for Research and Innovation, as proposed by the European Commission on 30 November 2011.³ In the spirit of the competitiveness pillar of Horizon 2020, research in three of the six key enabling technologies (KETs) is directly supported, as an important driver of innovation. The three remaining KETs, micro- and nano-electronics, photonics and biotechnology are indirectly supported through cross-cutting advances in materials and nanotechnology. Particular emphasis is based on cross-cutting issues between different KETs, and also between enabling technologies and societal challenges. Finally, there is continued support for developments that can be integrated to create the basis for tackling societal challenges and sustainability. The emphasis is on

² http://ec.europa.eu/research/industrial_technologies/support-to-innovation_en.html

³ COM(2011)808, 809, 811

resource and energy efficiency, protection of the environment and improvements in health care.

Thus, it is expected that activities under the competitiveness pillar of Horizon 2020 in the NMP area will be a natural and seamless continuation of those undertaken in the last years of FP7. Although there is an increasing emphasis on applications, longer-term, research in **key enabling technologies** is seen as a crucial driver of innovation in the areas of nanotechnology, materials and advanced manufacturing, and is also supported, mainly through small and medium collaborative projects. The guiding policy in this area is the Strategy for Key Enabling Technologies,⁴ which includes nanotechnology, materials and manufacturing, and sets the basis of the future of European industry.

With regard to **specific applications**, the following issues are addressed:

Energy and Energy efficiency: These activities are in tune with the Strategic Energy Technology (SET) Plan. They include topics in support of the '**European energy-efficient buildings**' PPP initiative, outlined below.

Environmental issues and sustainable development: These topics complement activities of the Environment and the Food, Agriculture and Fisheries, and Biotechnology (FAFB) Themes.

Raw Materials: This work programme contributes to the Commission's Raw Materials Initiative,⁵ and to the aims of the proposed European Innovation Partnership on 'Raw Materials' (section II.4.1).

Health and safety: This covers research based on nanomedicine and materials for health, complementing the Health Theme. It also includes research necessary to ensure the safe use of nanotechnologies, building on an extensive body of previous work under the NMP Theme.

Factories of the Future: The objective of this PPP initiative is to help EU manufacturers across sectors, in particular SMEs, to adapt to global competitive pressures by increasing the technological base of EU manufacturing through the development and integration the enabling technologies of the future, such as engineering technologies for adaptable machines and industrial processes, ICT, and advanced materials.

Energy-efficient buildings: This PPP initiative promotes green technologies and aims at the development of energy-efficient systems and materials in new and renovated buildings with a view to reducing radically their energy consumption and CO₂ emissions. These activities are in tune with the Strategic Energy Technology (SET) Plan.

Green Cars: This PPP initiative supports research on a broad range of technologies and smart energy infrastructures, essential to achieve a breakthrough in the use of renewable and non-polluting energy sources, safety and traffic fluidity.

I.4 International Cooperation

The general focus is on subjects which are in the interest of European industries and lead to "win-win" scenarios.

This work programme includes coordinated calls with China and Japan, on aspects of biomaterials and raw materials respectively (topics NMP.2013.2.2-2 and NMP.2013.4.1-1).

Furthermore, two topics in the Factories of the Future PPP (FoF.NMP.2013-3 and FoF.NMP.2013-9) are particularly suitable for collaboration at international level, particularly

⁴ COM(2009)512

⁵ COM(2008)699

under the IMS (Intelligent Manufacturing Systems) scheme.

I.5 Cross-thematic approaches

This work programme includes contributions to three cross-thematic public-private partnerships described above.

Special attention will be paid to cross-cutting marine and maritime research with the launch of a new cross-thematic call "The Ocean of Tomorrow: joining research forces to meet challenges in ocean management". It will be implemented jointly between Theme 2 "Food, Agriculture and Fisheries, and Biotechnology" (FAFB), Theme 4 "Nanosciences, Nanotechnologies, Materials and new Production Technologies" (NMP)⁶; Theme 5 "Energy", Theme 6 "Environment (including climate change)" and Theme 7 "Transport (including Aeronautics)". The main objective of the call is to promote research and innovation on marine technologies, in particular sensors, anti-biofouling materials, and innovative transport and deployment systems for the offshore energy sector. The topics and funding mechanisms will allow for large, multidisciplinary and multi-stakeholder topics with an appropriate balance between (basic/applied) research, knowledge transfer and demonstration, and to support a number of specific EU policies. The four topics are published in the Work Programmes of all participating Themes, as a cross-thematic call. "The Ocean of Tomorrow" call (FP7-OCEAN-2013) is subject to a separate call fiche.

I.6 Theme specific information

This work programme introduces each area and gives a description of the topics for which project proposals are invited. The description of each topic, in addition to the technical content and scope, includes any participation requirements (e.g. industrial participation) and the expected impacts.

Computer simulations and models, which have seen many advances and have the potential to revolutionise the design approaches of European industry, can be included where appropriate.

Standardisation, for projects whose results are nearing market introduction, is often a key enabler for interoperability and ensures product quality and open markets, thereby building consumer confidence. Standardisation can foster access to the market for innovative solutions and thus help ensure the practical application of research results. Projects can strengthen future innovation through standardisation by considering the inclusion of pre- and co-normative research, and the integration of standardisation organisations.

High-quality and creative product design is recognised as a key asset for the future ability of European industry to respond to demand and lead in the global competition. Where appropriate, innovative design has to be integrated with the development of technology. The knowledge base necessary for innovation combines cutting-edge science and technology with creativity and culture in the broader sense.

For each topic, the work programme also specifies which funding scheme is to be used:

- **Collaborative Projects:** *Small or medium scale focused research projects* and *Large scale integrating projects* (which may include additional activities such as demonstration, innovation-related activities, education and training) are implemented via separate calls. For

⁶ section II.4.2 of this work programme

these two funding schemes, there are upper and lower limits respectively on the requested EU contribution, set out in Section III, Implementation of Calls. **It is important to note that these funding limits are applied as additional eligibility criteria.** In general, *Small or medium scale focused research projects* are more research-oriented, whereas *Large scale integrating projects* are aimed more at research for applications and innovation.

- ***SME-targeted collaborative Projects:*** In these projects, the participating SMEs should have the decision making power (although the coordinator need not be an SME); and the output should be for the benefit of the participating SMEs and the targeted SME dominated industrial communities. Whilst there is no lower or upper limit on the requested EU contribution for this funding scheme, an **additional eligibility criterion** applies: the estimated EU contribution going to the participating SME(s) has to be 35% or more of the total estimated EU contribution.

- ***DEMO-targeted collaborative Projects:*** These collaborative projects have a special emphasis on demonstration activities, in order to prove the industrial viability of new technologies that have clear economic potential and/or societal advantages. Projects should focus on both research and demonstration activities, with a clear connection between them. The demonstration activities can include, for example, technical/economic review of the new technology, benchmarking and validation activities; the creation and testing of prototypes, test-beds or mock-ups; the up-scaling in industrial environments of research results available at laboratory scale; pilot implementation in industrial settings; and the possible creation of technology infrastructure for end users. The deliverables under the demonstration activities should lead to market uptake but should not be commercialised themselves, and product development is excluded. Demonstration of the new technologies to the wider community is also important in these projects and therefore a thorough dissemination and exploitation plan has to be among the project deliverables, in order to guarantee further application and market uptake. Whilst there is no lower or upper limit on the requested EU contribution for this funding scheme, the target is that proposals allocate around 50% of the total eligible costs of the project (excluding management costs) to demonstration activities.

- ***Coordination and Support Actions*** may relate to coordination, networking or supporting activities at European and international, national or regional level. The organisation of events, studies, where relevant, organisation and management of joint or common initiatives may be included, as well as activities aimed at supporting the implementation of the Theme, such as dissemination, information and communication and activities to stimulate and encourage the participation of civil society organisations.

The forms of the grant to be used for the funding schemes in this part of the work programme are set out in Annex 3.

NMP focuses on a wide range of industrial sectors and a wide range of RTD domains.

- The **range of industrial sectors** evidently covers those key sectors which concern industrial production, such as manufacturing and chemical processing, but it also extends to traditional sectors (construction, textiles etc.), which are moving up the high-technology innovation stream, and to other sectors striving to maintain and increase their leading position within the EU (electronics, photonics, medical equipment etc.). Manufacturing and construction have been specifically and particularly addressed through the PPP initiatives.
- The **RTD domains** supporting the transformation of industry include (a) nanosciences and nanotechnologies that are becoming one of the new paradigms and enabling factors across virtually all fields of science and technology; (b) materials that are rapidly

acquiring knowledge-based features; and (c) the products/production-related technologies that are pushing towards the 'factories of the future', something that will strongly underpin the revolution that is needed, as was illustrated by the emergence of the 'Factories of the future' PPP initiative within the EU recovery package.

Industrial involvement is crucial in safeguarding the industrial relevance of the activities supported in the NMP Theme. Direct industrial participation as partners in projects is encouraged across all topics of the NMP Theme.

The **submission** and **evaluation of proposals** for Collaborative Projects (including those dedicated to SMEs) will be carried out in **two stages**. The rationale for this is the nature of this Theme, which is multidisciplinary, cross-sectoral and SME intensive, and for which a 'bottom-up' approach is encouraged. On the other hand, the calls for the PPP initiatives will use a single-stage evaluation, reflecting the urgency of the recovery plan.

The first-stage proposal in two-stage evaluations should focus on the S&T content and on a clear identification of the intended results, their intended use and the expected impact (economic, social, environmental etc.). It will be evaluated on the basis of two criteria: **scientific quality** and **expected impact**. Coordinators of retained first-stage proposals will be invited to submit a complete proposal, which will be evaluated against the entire set of evaluation criteria.

I.7 Participation of women in research and gender dimension

The pursuit of excellence in scientific knowledge and in its technical application towards socially acceptable products, processes and services requires greater inclusiveness of a diversity of perspectives. In particular the overall process of transforming European industry will not be achieved without the talent, perspectives and insights that can be added by a more balanced participation of women and the integration of gender issues in RTD activities.

Increasing the diversity of perspectives particularly (but not exclusively) to gender issues at the level of the NMP objectives and topics may have a particular relevance in areas such as new business and organisational models, increasing the level of comfort and user friendliness provided by materials and industrial products, improved understanding of toxicity and risk and in all areas where industrial technologies research is aimed at medical application (e.g. nanomedicine - diagnostics, drug delivery or regenerative medicine). The NMP Theme is committed to undertaking specific measures to ensure practical uptakes of this issue together with industry.

More generally, and in accordance with the rules for the submission and evaluation of proposals, a reasonable gender balance in evaluation panels is sought⁷.

⁷ The European Communities pursue an equal opportunities policy and aims in particular at achieving in the medium term at least 40% of members of each sex in each expert group and committee (Commission Decision n°2000/407/EC of 19 June 2000 relating to gender balance within the committees and expert groups established by it).

II. CONTENT OF CALLS

This section describes all the topics for which proposals will be called in this work programme. This concerns only the content of the calls. For the practical modalities related to these calls, please refer to section III 'Implementation of calls'. For actions not implemented through calls for proposals, please refer to section IV 'Other actions'.

II.1 Activity 4.1 Nanosciences and Nanotechnologies

Nanosciences and nanotechnologies research, development and innovation are governed by an *integrated, safe and responsible policy framework*. This development strategy is being implemented through a wide range of activities whose purpose it is to ensure that development and deployment of nanotechnology are carried out in a way that takes people's expectations and concerns into account, especially as regards human and environmental safety, and delivers tangible benefits for the citizen and the society.

Sales forecasts for products incorporating nanotechnology range from \$1 trillion to \$3 trillion by 2015. Current sales figures are still some way away from these figures, but the growth trend is following the projections. Indeed, nanotechnology research results have started to migrate from the confines of the laboratory towards real applications in various industrial sectors.

Societal, governance and health-safety-environment related issues must seamlessly accompany the development of industrial applications. Research must be complemented by, and provide support to, a careful review of the regulatory landscape, reflections on ethical issues and outreach.

This is reflected in the WP structure, highlighting four areas of emphasis for nanosciences and nanotechnologies: *Maximising the contribution of nanotechnology on sustainable development; Nanotechnology for benefiting Environment, Energy and Health; Ensuring safety of nanotechnology; and Cross-cutting and enabling R&D.*

During the second half of FP7, the implementation is characterised by a gradual shift from fundamental research towards more application-oriented research. Faster introduction of nano-based applications into markets contributes to innovation-led competitiveness for European industry as well as provides significant societal and economic benefits.

In this context, the significant public investment made in nanotechnology research must provide a return to society in terms of contributing towards solutions to major societal challenges. Nanotechnology has significant potential to improve sustainability and to become a source of innovation in many industrial sectors.

The aim is, therefore, to cover important European Technology Platform related priorities for sustainability, e.g. in chemistry, construction, textile, fibres and forest based industries, transport and agro-food related sectors, with nanotechnology as the key enabling technology. Further, Energy, Environment and Healthcare are at the forefront of global challenges, and of concern to every citizen. Notwithstanding the significant economic potential of environmental,

energy and health technologies, nanotechnology must stand in the forefront for providing solutions.

In the light of available scientific evidence and public concerns associated with the potential risks of nanotechnologies and their applications, **scientific investigators are strongly encouraged to pay renewed attention to safety** – the safety of workers, the public and the environment. This work programme stresses not only the necessity to consider safety aspects from the beginning and the desirability of inherently safe design, but also requires that projects include a full scientific and/or technical risk assessment as well as proposals for risk mitigation measures, where appropriate.

Although safety is an integral part of all application related research, there is also a need for a more concerted approach. In nanosafety research, the emphasis of the NMP Theme is shifting from toxicology studies of individual nanomaterials towards more holistic safety assessment and management that manages overall risks. Agreed methods, techniques, equipment for toxicity studies, occupational exposure assessment and for risk reduction and mitigation will be an important part of this work.

As material systems and device structures become nanosized and nanostructured, significant challenges exist related to design and growth of these structures in a precise and reproducible manner. The analysis of their three-dimensional structure, properties and functions with a high level of precision poses another challenge. Detailed knowledge of e.g. the chemical, electronic and magnetic properties of nanomaterials is a pre-requisite for being able to tailor their functions in a controlled way. In the face of these challenges, the development of a wider range of nano-enabled applications requires continued significant R&D support in cross-cutting areas and technologies, such as instrumentation, characterisation, modelling and design.

II.1.1 Maximising the contribution of Nanotechnology to sustainable development

The potential contribution to sustainable development makes nanotechnology one of the key enabling technologies. This activity will give priority to potential applications incorporating nanotechnology in various industrial sectors which have a significant potential to improve sustainability e.g. in terms of material, energy or process efficiency, industrial productivity in addition to contributing industrial competitiveness and bringing benefits to consumers. The uptake of nanotechnologies in existing industrial sectors, while addressing unintended consequences, is expected to promote a step change in industrial performance and possibly leading to totally new production-consumption patterns or manufacturing processes.

Wherever appropriate, an interdisciplinary approach integrating different technologies, sciences or disciplines should be considered. This includes health, safety and environmental issues from life-cycle perspective as well as modelling, nomenclature, metrology and standardisation.

NMP.2013.1.1-1 Exploration, optimisation and control of nano-catalytic processes for energy applications

Technical content/scope: Catalysis is of vital importance to our society. The availability of high quality and inexpensive chemicals necessary to support a competitive economy relies on industrial catalytic processes. Catalysts are also the key to the development of novel technologies for sustainable energy production and distribution as well as environmental protection (e.g. emission control).

While the call topic NMP.2012.1.1.-1 focused on the rational design of nano-catalysts, the aim of this call is to develop pilot scale production for rational exploration, optimisation and control of nano-catalytic processes for sustainable energy production. The specific energy production concepts could include production of different fuels (e.g. synthetic, bio or solar fuels) as well as different sustainable feedstock.

More specifically, the goal is to design and up-scale catalytic energy production processes utilising next-generation high-surface area nano-dimensional heterogeneous catalysts with improved activity, durability and/or controlled chemical selectivity from laboratory scale to pilot scale. Approaches can be based on improvement of existing catalytic materials, and/or by development of innovative concepts for which the proof of principle has been given already. The final target is to demonstrate the technical and economic viability of the global process, i.e. from synthesis to efficiency and durability of the nano-catalytic systems.

The novel nano-catalytic systems with pre-defined properties require:

- Precise control over size and shape over length scales spanning 1nm-100nm, structure and composition of the catalyst, allowing efficient control of reaction pathways;
- Significant advances in theoretical descriptions and modelling for increased understanding of catalyst-support interactions, complex catalytic reactions performance and deactivation phenomena;
- Advances in nanoscale techniques, especially those that offer in-situ monitoring and which characterise the 'working state' of the catalysts under real conditions (e.g. elevated temperatures and pressures, high reactant flux) with the objective of predicting and intensifying complete catalysing processes.
- Long-term stability under operating conditions; Catalyst deactivation mechanisms, such as thermal and/or gas-induced sintering of nanoparticles or degradation of nanoparticles or nanostructures, should also be considered.
- Reduction of rare earths/precious metals catalyst loadings or the use of low cost non-precious metal based materials.

The operation of the nano-catalyst process in a specific energy production application(s) should be demonstrated in a relevant environment, displaying an improvement with respect to the current state of the art. Proposals should also include cost/benefit calculations for the studied specific application(s), demonstrating the economic viability and positive energy balance. Life cycle analysis and evaluation of the process concepts concerning safety assessments and toxicological impact should also be included from the beginning of process development. For safety related aspects, projects are expected to coordinate and collaborate with other relevant projects of the Nanosafety Cluster⁸.

Fuel cells are *not covered by this topic*, but by the topic SP1-JTI-FCH.2012.1.5, New catalyst structures and concepts for automotive PEMFCs.

The Commission will promote the exchange of information and identification of synergies between projects selected in this topic and in topic NMP.2012.1.1-1.

Funding Scheme: Large-scale integrating collaborative projects.

Expected impact: (i) Fast industrialization of tailor-made catalytic nanomaterials with high activity, selectivity and durability; (ii) Improved process performance, e.g. in terms of higher, precisely defined yield, optimum feedstock utilisation and lower energy consumption; (iii)

⁸ <http://www.nanosafetycluster.eu/>

Safer, greener nanocatalysts with minimum chemical waste; (iv) Alternative sustainable energy applications becoming technically and economically feasible; (v) Nano-catalysts also have the potential to reduce Europe's reliance on imported rare earths/precious metals.

NMP.2013.1.1-2 Self-assembly of naturally occurring nanosystems

Technical content/scope: The use of natural systems as either a source of inspiration or a template for developing or manipulating unique nano-, micro-, and macro-scale polymer composites via bio-mimicry and/ or direct assembly of molecules has become a promising field towards innovative products. Research on how naturally occurring nanostructures found in biomass self-assemble and the development of methods that use this self-assembly will be critical to manufacturing new products from this renewable resource.

The objective of the topic is to exploit the possibilities of biomass of plant origin (including aquatic plants and seaweed) in order to develop new innovative added value products from plant based nanosystems, such as glycopolymers, nanocrystals and nanofibres. These systems will, after self-assembly at nano-scale and functionalisation, present high added value properties, e.g. for flexible organic electronics, smart papers and surfaces, nanocomposites, glycosensors, self-healing materials, high thermal insulation materials etc.

Research should focus on the development of new nano materials or nano-intermediates through mastering the self-assembly of the elementary bricks at the nanoscale level, their properties at meso-scale and further their processing at macro-scale towards the elaboration of final products with controlled properties.

Research can also address the development of stimuli-responsive nano materials or nano-intermediates for applications in different value chains using biomimetics as design inspiration. Examples include specific and smart interaction with light, heat, chemical probes or other physical or chemical stimuli and the capability to change chemical and physical properties, e.g. enhancement of fibre-to-fibre bonds via photo excitation or switch from hydrophilic to super-hydrophobic character via ion exchange.

The project should target green processes and validate the industrial feasibility in a relevant environment of the new products with special attention on cost effectiveness with respect to the application market, from large volume sectors such as composites and surface treatments to niche markets and high added value sectors, like bio-active or stimuli responsive products for pharmaceuticals and health and safety applications.

The proposals should include Life Cycle Assessment (LCA) and risk assessment, contributing to the setting up of databases for LCA case studies, and address recyclability aspects as far as large volume applications are concerned. For safety related aspects, projects are expected to coordinate and collaborate with other relevant projects of the Nanosafety Cluster⁹.

Funding Scheme: Small or medium-sized collaborative projects.

Expected impact: (i) efficient technologies for self-assembly and functionalisation of naturally occurring nanosystems with smart properties for application in packaging, electronics, medicine, biocomposites, construction and other high-added value areas; (ii) development of green processes providing the industry with new solutions to create more value from plant based biomass through new high added-value products meeting societal

⁹ <http://www.nanosafetycluster.eu/>

needs; (iii) positive contribution to sustainability through the utilisation of renewable resources, replacing oil based ones.

II.1.2 Nanotechnology for benefiting environment, energy and health

Nanotechnology is an evolving technology which can significantly contribute to raising living standards and improving the quality of life. Many promising applications and products have been identified in the fields of environmental protection, energy efficiency, and healthcare and many more applications are expected in the future. Nanotechnology offers a potential 'win-win' opportunity for both meeting the most urgent societal challenges while contributing to the transition towards an eco-efficient economy and innovation-led growth. However, this potential is as of yet far from full realisation – and in many cases, the viability of industrial-scale applications needs to be verified in a way that replaces established industrial products and practices.

The main objective of this activity is to support the development of nanotechnologies that can benefit the environment, energy and health while addressing unintended consequences. Industrial innovation is promoted by developing nanotechnologies that will enable both the manufacturing of new, higher performance 'nano-enabled' services, products, components, devices and systems across a range of applications, e.g. environmental sensors and new therapeutics using nanotechnology. Wherever appropriate, an interdisciplinary approach integrating different technologies, sciences or disciplines should be considered. This includes health, safety and environmental issues from life-cycle perspective as well as modelling, nomenclature, metrology and standardisation.

NMP.2013.1.2-1 Nanotechnology-based sensors for environmental monitoring

Technical content/scope: Progress in nanosciences has led to a range of new technologies that allows us to drastically improve, and even rethink and create totally new industrial processes and products, offering new functionalities. Sensors are core elements in any intelligent system for monitoring and controlling natural and industrial environments, and nanotechnology is offering new functionalities opening for totally new sensors, sensing based systems and applications. For example high sensitivity allowing for new or lower levels of detection, long term stability for reliability in use and a much reduced size and affordable cost, enabling the integration of nanosensors, including networks of nanosensors into many other devices and systems.

The specific objective of this topic is to exploit progress in nanosciences to deploy nanotechnology in affordable, mass-produced sensors, and to integrate these into components and systems (including portable ones) for mass market applications in environmental monitoring. Sensing may include chemical, micro-biological and radiological parameters. Deliverables are expected to include the sensor design and fabrication considerations (including the use or development of modelling tools), a technology demonstrator and a positive production capacity feasibility study (including economic assessment) and plans for their commercial implementation.

Systems integration aspects to consider includes easy and fast (multi-)sensor interrogation and interfacing with monitoring and control functions. Reliability is required within the foreseen operating environment, considering temperature, humidity, and other parameters affecting stability. Initiation (re-setting) and calibration requires special attention.

The functionality should be demonstrated by integrating the developed sensor element into an existing or prototype system for validating its industrial relevance in a relevant environment.

Biosensors for monitoring the marine environment are *not covered by this topic*, but by the topic Ocean 2013.1 (section II.4.2).

Funding Scheme: Small or medium-sized collaborative projects

Expected impact: The projects are expected to: (i) demonstrate that nanosensors provide a technically superior, cost effective alternative to conventional sensors; (ii) contribute to the realisation of the market potential of the existing research results; (iii) to enable improved performance of applications in the fields of environmental monitoring, providing significant benefits to the citizens, environment and the European economy.

NMP.2013.1.2-2 Nanotherapeutics to treat bacterial infectious diseases

Technical content/scope: Infectious diseases are a major and increasing threat to human health and represent a very significant burden on healthcare systems worldwide and in particular for developing nations. Bacterial diseases such as Tuberculosis or infections with bacteria like MRSA often cannot be prevented by vaccination, lack early-stage diagnosis and treatment options. A major problem is the fact that bacteria are increasingly resistant to antibiotics.

The Commission recently launched its Action plan against the rising threats from antimicrobial resistance.¹⁰ A package of call topics for proposals supporting the aims of this Action plan through reinforcing and coordinating research and innovation can be found in three FP7 Cooperation Work Programmes, Health (HEALTH.2013.2.3.1-1, HEALTH.2013.2.3.1-2 and HEALTH.2013.3.1-1), KBBE (KBBE.2013.1.3-05) and NMP (this topic).

This call topic aims at developing novel nanotechnology enabled therapies for bacterial infectious diseases. For example, it is recognised that molecules of biological or semi-biological origin present new opportunities to address infection. Formulating such molecules into effective agents will require innovative use of nanotechnology and strong interdisciplinary coordination between academics, research organisations, clinicians, pharmaceutical companies, biotechnology communities and early involvement of regulators. Furthermore, new classes of drug delivery system are needed to allow therapeutic macromolecules to access diseased organs. These should inherently be at the nanoscale to take advantage of biological transport pathways, but also need novel functionalities and new mechanisms to be truly effective. Use of state-of-the-art diagnostics systems and access to expertise on diagnostics in the projects is encouraged, to support the therapy development. Attention should be paid to address regulatory aspects of safety, good laboratory practice and good manufacturing practice. Development may be taken to the end of the pre-clinical stage and may include the preparatory regulatory work for the start of clinical testing, but the clinical testing itself may not be part of the projects.

Funding Scheme: Large-scale integrating collaborative projects.

Expected impact: (i) potential for radical improvement of therapy for bacterial infectious diseases, directly benefiting EU citizens; (ii) improvement of the competitiveness of the European healthcare sector through novel new systems and therapies as well as improved

¹⁰ Commission Communication 'Action plan against the rising threats from Antimicrobial resistance', COM(2011)748.

cooperation and collaboration between the key actors in the value chain; (iii) increase of the application of nanotechnology in medicine; (iv) improve understanding by academics of medical regulatory issues.

II.1.3 Ensuring the safety of Nanotechnology

Nanotechnology-based applications will substantially improve the performance of many products through the unique properties of engineered nanoparticles. The same properties, however, raise questions and generate concerns with regard to potential health and safety risks.

To support the safe development of nanotechnologies, these risks should be managed through identification of the hazard, knowledge of the potential adverse effects, measurement and control of the exposure. Risk management should become an integral part of the culture of the organisations involved in the supply chain. The objective is to support methods, techniques and equipment for material characterisation, hazard identification, occupational exposure assessment and risk reduction and mitigation and their demonstration. The environmental fate and end-of-life treatment of products and waste containing nanomaterials are also of prime importance.

For the production and use of passive nanoparticles and for their integration into nanomaterials or products a fair amount of work in the above fields of risk research is currently at hand or in preparation including regulatory testing. Attention should now shift to breakthrough research for the more challenging issues related to the safety of active nanoparticles and systems. As a next phase of the regulatory testing, attention should be put on targeting risk reduction and mitigation in industrial environments. The aim is to develop and demonstrate safe processes reducing or eliminating risk by engineering-out hazards or containing exposure, or other risk reduction solutions.

Two more specific actions aim at providing capacities of crucial nature though not entirely safety related. As data start accumulating on material properties, hazards and exposure, and their relationships, the question of saving, analysing, validating and sharing information for subsequent use in predictive computational models, simulations, rational design of nanomaterials and synthesis control, needs corresponding efforts in the area of ontologies and databases.

NMP.2013.1.3-1 Safety in nanoscale production and products

Technical content/scope: Ensuring the safety of the production processes involving nanomaterials as well as that of the final product, is a pre-requisite for the commercialisation and societal acceptance of these new technologies. This topic takes a bottom-up and top-down approach to safety, by securing both the nano-manufacturing processes and the nanoscale products' ultimate fate. This will ensure control over, and minimisation of, worker, consumer and environmental exposure to nanoscale materials throughout the whole product chain - from cradle to grave of nano-enabled products.

The objective is to ensure that the knowledge exists to allow safe processes for production and use/recycling of nanomaterials/nano-products. This will be addressed through the development of safe processes for production, transport and use of nanomaterials, as well as the development of methods, techniques and equipment reducing both adverse effects and exposure to acceptable levels.

The research should focus on:

- development of best practices for materials and product or process types where a lack of waste isolation and handling possibilities currently exist;
- risk mitigation methods, techniques and equipment involving nanomaterials or nano-manufacturing processes where the development or usage pattern may be as free form nanoscale materials, resulting in exposure in open and production environments;
- development of tools for assessing nanomaterials exposure and effects on ecosystem services (such as waste water treatment plants) and humans, especially in environments subjected to multiple stressors, diffuse pollution and global changes.
- development of methods to enable prediction of long term ecotoxicological effects and impacts on ecological services caused by exposure to nanomaterials (used e.g. in coatings, composites, energy and construction related applications), as well as raw materials for nutraceuticals, food and feed and nanocellulose derivatives.
- incorporating the generated knowledge into guidelines for safe nanoscale product and process design.

Outputs should be tailored to address the needs of each of the stakeholder communities, including industry and regulators.

Funding Scheme: Large-scale integrating collaborative projects.

Expected impact: (i) best practice guidance for securing both nano-manufacturing processes and nanoscale products' ultimate fate, including development of approaches for safe disposal of nanomaterials where needed; (ii) development of tools for assessing nanomaterials effects on ecosystems already subject to multiple stressors; (iii) development of implementable processes for all stages of the nano-manufacturing life cycle to reduce exposure to nanomaterials; and (iv) innovative solutions for risk management in industrial settings.

To maximise their impact, funded projects will be expected to align with the EU NanoSafety Cluster¹¹, in order to facilitate research cohesion, integration, and advancement of the NanoSafety Cluster agenda; and to establish good cooperation with international organisations (OECD and ISO/CEN). The necessary resources and tasks are also expected to be foreseen in the proposals.

NMP.2013.1.3-2 Nanomaterials safety assessment: Ontology, database(s) for modelling and risk assessment

Technical content/scope: The issues surrounding coherence, management and uses of nanomaterials toxicological data is rapidly becoming a roadblock to progress in integrated approaches to risk assessment. A concerted effort is needed to systematically address these issues through the development of a comprehensive ontology and a computational infrastructure for transparent data sharing, data analysis, and computational models of structure-property-activity relationships. All aspects around nanomaterials safety assessment should be addressed, inter alia: nanomaterials synthesis and processing, nanomaterials characterisation (pristine and *in situ*), exposure and life cycle assessment, human and ecological hazard assessment, as well as high throughput and high content datasets (e.g. proteomics, transcriptomics, metabonomics, High Content Analysis), nano-bio interactions studies, inter-laboratory comparisons etc.

¹¹ <http://www.nanosafetycluster.eu/>

The development of ontologies should bear in mind existing standardization initiatives, allowing correlations between datasets, and should address mainly research purposes but with the capacity to link with regulatory databases and drive the latter's' further development. The database should be organised to facilitate a meta-analysis of the data, using methods such as QSAR, to identify the key physico-chemical parameters influencing the nano-bio interaction and therefore contribute to the future development of 'safe-by-design' nanomaterials. This project should also work in alignment with the project(s) funded under topic NMP.2013.1.3-3 to ensure that the needs of next generations of nanomaterials are also included in the database structure and ontology. It should also be cognizant of international efforts in this arena, including work done for regulatory purposes and market follow-up and ensure compatibility with these efforts for data validation and sharing.

Based on the developed ontology and data requirements, tools for optimal experimental design, data reporting and metadata structures and a database should all be developed and provided to the research and regulators communities. The database should ensure continuity with the experimental results from previous and running FP7 projects, bearing in mind the need to provide sufficient data to allow conversion to newly emerging standards and ensure appropriate quality and completeness. The database implementation should address the required levels of data protection (e.g. pre-publication or pre-commercialisation), data quality assurance, data-sharing capability, and communication with other national or international databases and search tools.

Funding scheme: Small or medium-sized collaborative projects. No more than one project will be funded.

Expected impact: (i) an agreed ontology for nanomaterials; (ii) a set of guidelines for experimental design to ensure production of high quality data of sufficient longevity and usefulness for research; (iii) implementation of the database structure with all of the necessary provisions for data protection, data sharing, data quality assurance, searchability, tailored interfaces for different needs and usages, comparability and cross-talk with other databases; and (iv) fostering an integrated approach in nanosafety assessment, which is inclusive, consensus-driven and serves the needs of the European research communities.

To maximise its impact, the funded project will be expected to align with the EU NanoSafety Cluster¹², in order to facilitate research cohesion, integration, and advancement of the NanoSafety Cluster agenda; and to establish good cooperation with international organisations (OECD and ISO/CEN). The necessary resources and tasks are also expected to be foreseen in the proposals.

NMP.2013.1.3-3 Development of a systematic framework for naming and assessing safety of the next generations of nanomaterials being developed for industrial applications

Technical content/scope: As part of the Innovation Agenda, concerted efforts are needed to develop a robust, implementable approach to the naming and safety assessment of the next generations of nanomaterials and nanosystems such as hybrid nano-molecular systems, and organic-inorganic or passive-functional nanomaterials. These systems are already being developed in industry for a range of innovative applications such as renewable energy and greener construction, and approaches are needed that will allow these products to reach the market safely and effectively, as a matter of priority. Research has shown that lack of clarity

¹² <http://www.nanosafetycluster.eu/>

around regulation is significantly more costly to companies than additional safety assessment requirements, known at an early stage in the product development cycle, and thus the current regulatory uncertainty should be addressed as a matter of priority.

Among the challenges to be addressed is the issue of naming for such hybrid nano-molecular nanosystems and nanostructures; understanding which components determine the biological interactions and thus the fate and behaviour of these advanced nanostructures and nanomaterials, and understanding how to make these materials safe by design. Priority should be given to the next generation of nanomaterials for renewable energy, green construction, and other emerging technology areas.

The research elements should address development of the understanding of their environmental behaviour and fate, in indoor and outdoor air, water and soil, and their consequences for interaction with living systems and/or the environment, throughout the product lifecycles. The project should also account for management of risk perception around active nanomaterials.

Additional eligibility criterion: The requested EU contribution must not exceed EUR 7 000 000 per project.

Funding scheme: Large-scale integrating collaborative projects. No more than one project will be funded.

Expected impact: The research approach should be innovative and represent a significant advance beyond the current state-of-the-art, offering innovative approaches to account for the unique features of complex nanosystems, and should result in (i) An implementable naming system to allow identification of the components and assembled structure; (ii) New methods for safety assessment of complex nanosystems, easily implementable by SMEs and technology development centres. Outputs should be tailored to address the needs of each of the stakeholder communities, including specifically the industry technology application developers and end users, taking into account the unique features of complex nanosystems.

To maximise its impact, the funded project will be expected to align with the EU NanoSafety Cluster¹³, in order to facilitate research cohesion, integration, and advancement of the NanoSafety Cluster agenda; and to establish good cooperation with international organisations (OECD and ISO/CEN). The necessary resources and tasks are also expected to be foreseen in the proposals.

II.1.4 Cross-cutting and enabling R&D

The future development and uptake of nanotechnology by EU industry depends upon the development of an efficient and productive research and innovation infrastructure based on interdisciplinarity. It requires as an input collaborative research from several fields of sciences such as: biological sciences, physics, chemistry, electronic, engineering, mathematics, environmental and safety related disciplines, cognitive sciences, social sciences, etc. Its targeted outcome is the creation of knowledge, based on the understanding of the phenomena (nanoscience) at the nano-scale, and their translation into technological know-how (nanotechnologies) to master processes and to develop leading edge research tools, techniques and productive assets, vital for nano-enabled product development.

This activity supports cross-cutting and enabling R&D activities that would enable atomically precise control of processes. The target is to preserve the designed nano-structure and

¹³ <http://www.nanosafetycluster.eu/>

(active) nano-systems with novel or pre-defined properties and behaviour when translated into scalable industrial systems related to their applications.

Metrology and instrumentation that underpin most nanotechnology research and tools supporting industrial application development receive particular attention. The implementation of the recently published definition of nanomaterials requires validation of a number of available methods and equipment for high performance- low cost measurements of particle number or mass distribution of nanoparticles in media.

NMP.2013.1.4-1 Development of an integrated multi-scale modelling environment for nanomaterials and systems by design

Technical content/scope: The future of the European nanotechnology industry is associated with a strong modelling and simulation capacity. An efficient numerical approach is needed to shorten the development process of nano-enabled products, being key to increased global competitiveness of our industries. Therefore, the long term overarching ambition is to create an open, integrated and multi-purpose numerical nano-design environment. This environment will allow to bundle and connect existing solutions, to link them to validated data repositories and to harmonise the development of new simulation modules.

The proposals should clearly address key elements such as: (i) free and open source code principle, in the sense of the GNU Lesser General Public License (GNU LGPL), at least for the common environment and interface part developed within the project; (ii) harmonised approach in the interface design to facilitate the future implementation in larger and extendable framework architecture; and (iii) interfacing with commercially available simulation packages, where used for the project.

As required by the overall objective, part of the effort should be on the key and transverse issues of code modularity and reusability. These modules should connect a variety of models which might range from *ab initio* codes, molecular dynamics and other discrete particle models up to Finite Element simulations at the continuum scale. The application of topology optimization techniques and modelling and optimization with uncertainties may also be included.

Work should also significantly contribute to the understanding of the underlying phenomena of multiscale modelling, such as the coupling of the scales in the model and the consistency between scales (e.g. reversibility across scales/boundaries).

Work should focus on a cluster of related technologies of significant economic impact. By implementing a multi-scale and multi-physics approach, it should target rapid progress on challenges tackled through dedicated codes to simulate at least a full device, possibly a system.

All proposals should have an element of model validation in which the models are validated against experimental data at least at functional level. This data should either be collected during the project or should be pre-existing.

Industrial end-user participation is recommended to guarantee relevance and facilitate validation.

Consortia should further demonstrate their future capability to distribute and provide support to the user environment. This will probably require participation from both scientific and industrial modelling and code developers and software code vendors or other established distributors of modelling tools.

To facilitate a harmonised approach the financed projects have to interact on the definition of software interfaces, and the development of inter-process, and inter-scale communication.

Funding scheme: Small or medium-sized collaborative projects

Expected impact:

(i) The resulting tool will allow predictive design of novel materials and material/shape/microstructure combinations, optimised for specified applications, (e.g. to minimise the environmental impact, reduced risk of product failure, increased life, device performance and efficiency).

(ii) Integration of computational codes from many different sources to interoperate allows solving of problems that are not addressable by individual codes.

(iii) To maximise their impact, funded projects will be expected to interact in a cluster aiming at creating the standards and processes required to enhance code modularity and reusability, in order to pave the way for an integrated and versatile numerical design environment.

(iv) The projects should increase the interaction between the nanotechnology research fields, in particular with respect to numerical code development and interconnectivity.

(v) Projects should provide an educational resource in computational science and engineering, with respect to the specific problems of multi-scale modelling, such as scale coupling and reversibility across scales.

NMP.2013.1.4-2 Metrology research for the development and validation of design rules for engineering of nanostructured and nano-enabled materials and devices

Technical content/scope: Solid basis of nano-metrology and standards is a key pre-requisite for reproducibly measuring key operational characteristics of materials, structures, devices, facilitating also their simulation and design. Metrology is also a key for the reliable assessment of health, safety, and environment risks associated with nanomaterials and processes as well as operating processes in a reproducible manner.

Research efforts are needed at two levels: (i) the development of methods for measuring properties for which currently no methods exist; and (ii) ensuring the traceability, or at least the reproducibility, of existing methods; both for the entire range of physical, chemical, and biological properties that affect the performance of materials, devices and systems. This topic aims at projects realising a breakthrough in measurement and modelling ability that is directly relevant to production / manufacturing processes.

Projects should aim to:

- Characterise the relationship between measurable key parameters through the nanoscale to the higher order scales that provide new insight into the performance of nanostructured and nano-enabled material;
- Generate reference information to test and optimise new design rules derived from length scale models;
- Establish mechanisms to integrate new design rules to existing modelling techniques and apply these to industrially relevant materials and devices, delivering concrete results of industrial relevance (for example, the ability to design nano-coatings or nano-enabled coatings with specific performance properties).

Preference will be given to projects that include the development of traceable measurement methods which can become the basis of international standards. In stage-2 proposals, an

indicator of this potential will be the involvement of metrology institutes and/or standardisation bodies.

Funding Scheme: Large collaborative projects

Expected impact:

- (i) The move from 'trial and error' based product development to digital product development and product life cycle environment should dramatically reduce the cost of designing new products.
- (ii) Help industry, and SMEs in particular, to access and deploy nanotechnology in existing and new products.
- (iii) Improved performance of processes and final products.
- (iv) Advancement of standardisation in the nanotechnology field.

NMP.2013.1.4-3 Development of methods and standards supporting the implementation of the Commission recommendation for a definition of nanomaterial

Technical content/scope: The Commission recommendation for a definition of nanomaterial provides a reference for determining whether a material should be considered as a 'nanomaterial' for legislative and policy purposes in the Union. This Definition addresses particulate materials only, is intended for broad application in Union legislation, is based only on the size of a material and covers natural, incidental or manufactured materials. Measuring average size and size distribution of particles in the range 1 nm to 100 nm in mixtures with other particles and substances is challenging and for most nanomaterials different measurement methods will give different results. Depending on the type of nanomaterial and on its intended application, different methods will be required which ensure that the application of the definition leads to consistent results across similar nanomaterials and over time.

The research project envisaged by this call should therefore address the measurement of average size and number-based size distribution of particulate materials. The project should develop robust, cost-effective and fast validated methodologies for the quantitative analysis of the number-based size distribution of primary particles, of different shapes (e.g. nanoplates, nanofibres, nanotubes), of different coatings and in various media (including complex media and final products), which have one or more external dimensions in the size range 1 nm – 100 nm. The proposed methodology will have to be fully validated in the project, for an as wide as possible range of different materials, addressing size and particle number based size distribution of primary (constituent) particles in various environments, such as powder, aerosol, dispersion in water and other dispersion media. Validation should include sampling, calibration of equipment, estimation of measurement uncertainty, certified reference materials, reference materials and mixtures, and demonstration and training.

The project should aim at methodologies capable to measure the size of particles of different shapes in order to identify whether a material is a nanomaterial according to the Commission recommendation. It should also address the measurement of size and number-based size distribution in complex media (e.g., biological fluids, environmental media) as well as in final products such as cosmetic products and food/feed, and give clear quantitative information. Where possible, the project should also address the specific surface area by volume and its relation to the number based particle size distribution.

For each proposed method, the project will have to perform an intra-laboratory validation and an inter-laboratory study.

Preference will be given to proposals that develop traceable measurement methods that are readily implementable in the form of robust and cost-effective instruments. In stage-2 proposals, an indicator of this potential will be the involvement of metrology institutes (or institutes certifying reference materials). Active participation of nanomaterials manufacturers as well as instrument manufacturers, who commit to develop and market robust and cost-effective instrumental implementations of the developed methodologies, represents an added value. Additionally, it is also essential to establish links to CEN feeding such methodologies into the currently on-going Commission mandated standardisation work.

Additional eligibility criterion: The requested EU contribution must not exceed EUR 7 000 000 per project.

Funding scheme: Large-scale integrating collaborative projects. No more than one project will be funded.

Expected impact:

(i) Development of methods for off-line or on-line measurements that ensure the reliable and economic implementation of the Definition in the most diverse fields and are applicable for the widest possible range of materials and products.

(ii) Development of one or more work item proposal(s) within the time schedule of the project, for a European or international standardisation body, including (a) detailed first draft(s) of the standard method(s).

NMP.2013.1.4-4 Developing innovative outreach and dialogue on responsible nanotechnologies in EU civil society

Technical content/scope: Effective governance of nanotechnology benefits and risks require innovative new means of information and communication. Such a communication is essential for public confidence in policies that respond to societal and economic needs.

Nanotechnologies evoke various opinions from full acceptance to rejection. The proposed action(s) should therefore aim at identifying the current information and communication needs in EU civil society on nanotechnologies, creating new models and tools for outreach and unbiased dialogue on nanotechnologies. Such models would be founded on balanced information about nanotechnologies and their relevant applications for daily life as well as incorporate attitudes, interests and value judgments. Further, the models would need to offer a profile both for benefits and potential risks associated with the applications of nanotechnology. While the work should build on the results of previous projects in the domain of communication of nanotechnologies, such as NANODIALOGUE, NANOYOU, NANOTOTOUCH, TIMEFORNANO, preference will be given to proposals targeting the development of new strategies for communication outreach and dialogue tailored for different stakeholder audiences. This would include the creation of effective mechanisms for engaging lay citizens, scientists, policymakers and NGOs in decisions about nanotechnology R&D over the long term, promoting responsible nanotechnology innovation in the EU. Efforts should be made to increase the diversity of the stakeholders and reach people who are often underrepresented in interviews and public opinion surveys, such as people with lower income.

Another key target is the enabling of the dialogue between young people and students who are ready to make career choices and universities and industries involved in nanotechnology applied research, involving young professionals working in small or medium sized companies,

or university spin-offs, which exploit nanotechnologies is a key target. The effectiveness of the communication strategies and tools is also to be tested in various settings, such as science centres and museums or specific civic fora, using developments on key criteria and principles of responsible innovation and public engagement.

Additional eligibility criterion: The requested EU contribution must not exceed EUR 2 000 000 per project.

Funding Scheme: Coordination and Support Action (support actions). No more than one support action will be funded.

Expected impact: The sustainable impact of this action should be to enhance and raise the levels of engagement of European citizens, expert and non-expert, in a measurable and traceable way on the subject of nanotechnologies and their related social, ethical and legal implications by supporting activities with broad range of stakeholders. Finally, innovative publishable materials (e.g. web, kits, media communications, books, DVD and events) should be developed to disseminate and assess the outreach and dialogue figures attained by the project during its entire life cycle. Increase the clarity of the role of public authorities, industry and society in formulating appropriate governance of nanotechnologies.

II.2 Activity 4.2 Materials

Better mastering of materials has characterised the development of human societies since the dawn of humanity. Nowadays, 70% of all technical innovations depend directly or indirectly on the properties of the materials and their use, and this percentage is expected to increase further. Therefore, unsurprisingly, materials have been identified as one of the Key Enabling Technologies for Europe. During the coming decades, materials research and innovation will herald a new age, allowing European products and industrial processes to become more competitive and sustainable, or devising completely new products and processes. To promote and accelerate progress, the NMP theme will foster an integrated and multidisciplinary approach, involving chemistry, physics, engineering sciences, theoretical and computational modelling, nanotechnology and increasingly the biological sciences. A thorough control of materials and their production at an atom/molecule scale, as well as the realisation of materials-based systems and their flow into and out of Europe will be the final target. The flow of materials will also be addressed to contribute to the efficiency of the European industrial economy.

The 'convergence of disciplines' will be a key tool for progressing in materials science and engineering; research implementing this concept will be supported in this work programme. The structure is composed of three parts: Enabling Research and Development (exploiting the interdisciplinary character of materials science and engineering and introducing the potential of opening new business areas or production routes), Innovative Materials for Advanced Applications (addressing five selected branches of industry: Healthcare; Information and Communication Technologies; Energy; Transport and Environment, including the substitution of critical raw materials), and Structuring Actions (creating or reinforcing synergies which will enable the release of the untapped potential of European research).

II.2.1 Enabling Research and Development

The development of solutions in materials sciences and engineering (including 'horizontal technologies') will be supported, in order to overcome scientific, technological and related bottlenecks enabling new technologies that can give European industry a strong competitive advantage in the years to come. These technologies are multidisciplinary, cutting across many technological areas with a trend towards convergence and integration, and can assist technology leaders in other fields to capitalise on their research efforts as well.

Greater emphasis on the fundamental understanding of materials will lead to a qualitatively better control over their properties, as well as to the development of new materials. With this respect, European competitiveness will be directly related to the ability in maintaining advanced technology in experimental facilities and continuously developing new analytical tools. Cross-cutting priorities will be the development of new instrumentation methods; the early characterisation and prognosis of the behaviour of new materials in components and under operating conditions; and the understanding of complexities, nonlinearity and functionalities through bottom-up approaches and materials design.

NMP.2013.2.1-1 Developing new precursors, new processing routes and functionalisations for carbon fibres

Technical content/scope: The use of carbon fibre based composites is of major importance in many industrial applications, such as (i) in transport e.g. automotive (body and chassis), marine (ship structures), rail (vehicle body, internal fittings), aerospace (fairings, seat structures, luggage racks, galley equipment), (ii) energy e.g. wind (blades and turbines), electrical (Li-ion batteries, supercapacitors), electrical storage and transmission (low mass, zero-CTE transmission cables, flywheels for energy storage), oil and gas (pipes, drill shafts, off-shore structures), pressure vessels (hydrogen storage, natural gas storage), (iii) infrastructures (retrofitting and repair of aging bridges and columns, pre-tensioning cables, pre-manufactured sections, and non-corrosive reinforcing bars) and many other industrial fields, whose extent may well increase in the future. However, carbon fibre applications risk being restricted or jeopardised because of the high cost of carbon fibres and their limited supply. Moreover, the translation of fibre properties into those of the final composite is not yet fully understood. Research is therefore needed to allow the opening of new ways for the industrial production in Europe of carbon fibres as well as their functionalisation for targeted applications, and at affordable cost.

Research proposals should address the development of new, economically viable precursors. Proposals should also address one or more technological challenges, examples of which include exploration of alternative sustainable carbon supplies (e.g. bio-based or from recycled fibres), innovative processes for fibre formation, stabilisation, carbonisation/graphitisation and their streamlining and improved control, lowering production costs in order to find favourable cost/performance solutions, fibre functionalisation through innovative surface treatments, carbon fibre ionised physical vapour deposition (I-PVD) on line treatment, sizing, fundamental understanding of interactions, e.g. between carbon fibre and composite matrix fields, dwelling fibre placement, mechanical interlocking of fibre to resin, etc. Life Cycle Assessment (LCA) of the new processes or materials used, their energy efficiency, as well as environmental and safety issues and recycling should be addressed. Proof of concept in terms of product and/or process should be delivered within the project, excluding commercially usable prototypes (in compliance with European Commission Communication 2006/C323/01), but convincingly proving scalability towards industrial needs. Non-destructive techniques for the characterisation of fibres at the various processing steps and of functionalised fibre products may also be addressed. Dedicated modelling of process and properties, qualification, standardisation and/or the production of (certified) reference materials may also be addressed as an integrated part of the research proposal. In order to ensure the industrial relevance and impact of the research efforts, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding scheme: Large-scale integrating collaborative projects.

Expected impact: One or more of the following: (i) European independence from imported carbon fibres and precursors; (ii) Improved competitiveness for European industries via the use of improved, novel, better performing and/or more favourable cost/benefit solutions; (iii) Deployment in Europe of materials structures with overall performance comparable to existing technologies but at lower material cost; (iv) Securing adequate in-service performance of components in applications such as vehicles, construction, energy, sports, electronic applications etc. at lower material cost and with due concern for recyclability issues; and (v) new skills in the European workforce resulting also in indirect socio-economic benefits.

II.2.2 Innovative materials for advanced applications

NMP-Materials research will support industry's longer-term research and ambitious industrial innovation, particularly in those branches of industry where considerable potential exists in terms of socio-economic impacts. Addressing these issues successfully will grant our children the right to live in a world similar to, or even better than, that of our generation. Research will focus on the design, development and engineering of innovative added-value materials and unlock their potential for selected technological applications. The development of application-oriented materials requires the specific design of highly efficient materials and processes that encompass phenomena and architectures at the atomic scale. Research should lead to optimising the engineered properties of materials at higher length scales and thus to improve the functional properties of the final products.

Following the input of the NMP Expert Advisory Group, five priority key areas of activity will be addressed: Healthcare; Information and Communication Technologies; Energy; Transport and Environment (including the substitution of critical raw materials). In addition to the topics in this section, a topic related to energy has been included as part of the Energy efficient Buildings initiative (see section II.5.2 below); and a topic related to transport has been included as part of the Green Cars initiative (see section II.5.3 below).

NMP.2013.2.2-1 Biomaterials for Advanced Therapies and Medical Devices in the neurological/neuromuscular or cardiovascular fields

Technical content/scope: Advanced Therapy Medicinal Products¹⁴ (ATMPs) are new medical products based on genes (gene therapy), cells (cell therapy) and tissues (tissue engineering). Their arrival heralds a new age for the treatment of a non-comprehensive list of diseases or injuries, such as skin regeneration for burns, Alzheimer's disease, cancer, myocardial infarction, stroke, muscular dystrophy or multiple sclerosis. Medical Devices¹⁵ cover a wide range of products, from simple bandages to the most sophisticated life-supporting products, as well as instruments for the diagnosis, prevention, monitoring and treatment of diseases and the improvement of the quality of life of people suffering from disabilities. The value of the market for Value-Added Materials, of which biomaterials for these interventions are examples, is expected to double within the next ten years. Great potential therefore exists both for patients' well-being and for economic activity. As well as depending upon biological materials, such as tissues or cells, the success of these healthcare interventions also requires the presence of chemical structures such as prosthetic implants or polymer scaffolds. The success of these treatments will therefore depend critically on the biocompatibility and risk of infection of the biomaterial(s) used to produce these associated implants.

Research proposals should develop and/or validate specific biomaterials (including peptides/proteins) or a novel combination thereof, for use in an eventual Advanced Therapy Medicinal Product or Medical Device. Applications should address diseases or conditions in the neurological/neuromuscular or cardiovascular fields. They are expected to generate comprehensive pre-clinical data, but clinical trials may not be included. A realistic endpoint

¹⁴ As defined by Regulation (EC) No 1394/2007 on advanced therapy medicinal products (gene therapy, stem cell therapy and tissue engineering)

¹⁵ As defined by Council Directive of 20 June 1990 on the approximation of the laws of the Member States relating To Active Implantable Medical Devices (90/385/EEC) (OJ L 189, 20.7.1990, p. 17) (as amended), Council Directive 93/42/EEC of 14 June 1993 concerning Medical Devices (OJ L 169, 12.7.1993, p. 1) (as amended) and Directive 98/79/EC of the European Parliament and of the Council of 27 October 1998 on *In Vitro* Diagnostic Medical Devices (OJ L 331, 7.12.1998, p. 1) (as amended) and with the relevant Implementing Measures.

of the project should be appropriately described and justified. By the end of the project, the generated biomaterial should be in an optimal position to enter a clinical trial in humans, which is not within the terms of reference of this Call for Proposals. Preclinical regulatory affairs should be completed or taken to an advanced stage of preparation. Therefore, experimental protocols should be planned taking due account of current good laboratory practice (GLP) and ISO guidelines. Manufacturing processes will need to be addressed, including up-scaling, good manufacturing practice (GMP), process analytical technology (PAT), and regulatory work as appropriate. Biomaterials should be characterised with respect to the responses they elicit, such as toxicity, the migration properties and shape of cells, or changes in intracellular signalling pathways. In addition, proposals will be expected to show that the regulatory and IPR strategy is compatible with the overall RTD objectives. An expected deliverable will consist of at least one implant or components thereof, together with a proof of concept and preclinical validation.

In order to ensure an efficient implementation and maximum impact of SME-related activities, the leading role of SMEs with R&D capacities will be evaluated under the criteria 'Implementation' and 'Impact': the coordinator does not need to be an SME but the participating SMEs should have the decision making power in the project management; and the output should be for the benefit of the participating SMEs and the targeted SME dominated industrial communities.

Funding Scheme: SME-targeted collaborative projects.

Expected impact: One or more of the following: (i) Innovative biomaterials for the therapy of diseases whose treatment is expected to derive from and rely on advanced therapy medicinal products or medical devices; (ii) Improved performance of advanced therapy medicinal products or medical devices; (iii) Improved quality of life due to improved biocompatibility and longer duration of these healthcare interventions; (iv) Success of European biomaterials industries; and (v) Contribution to achieving EU policies, such as those mentioned in the Commission's Communication on dealing with an ageing population.¹⁶

NMP.2013.2.2-2 Biomaterials: Imaging and rapid precise prototyping technology for custom made scaffolds – coordinated call with China

Technical content/scope: The introduction of rapid prototyping or solid freeform fabrication (SFF) in the biomedical field has led to the possibility of dividing scaffold fabrication techniques into 'conventional' and 'novel' methods. By using the 'conventional' scaffold techniques it is difficult to control all structural properties, and they need to be shaped with custom-made moulds. Conversely, the application of solid freeform fabrication (SFF) to tissue engineering and material induced regenerative therapies represents the key to producing customised scaffolds with reproducible internal morphology. This allows for a higher degree of architectural control, making structures that, for example, increase the mass transport of oxygen and nutrients throughout the scaffold or mimic biological structures.

Research proposals should address 'novel' methods integrating medical imaging, e.g. computed tomography (CT) or magnetic resonance imaging (MRI), and rapid micro/nano prototyping in order to create customised scaffolds for tissue regeneration or repair. Application of novel biomaterials is of particular interest. The resulting scaffolds should have the shape as well as the mechanical and physiological properties required to correct the

¹⁶ COM(2009)180

damaged tissue site. The ability of the structures to lead to physiological tissue regeneration should be demonstrated using appropriate model systems, ensuring that subsequent translation of the technology into the clinic is feasible. To this end, production and processing of the proposed materials as well as sterilisation of the implantable structure should also be considered.

This call targets a balanced cooperation from European and Chinese organisations in each project, with approximately equal research effort on both sides. In order to assure genuine EU-Chinese cooperation, it is important that the proposed research plan properly includes integrated and coordinated research activities in the EU and China. The establishment of a close collaboration between European and Chinese partners is mandatory, and *proposals not including such collaboration will be deemed ineligible*. The added value of the European-Chinese cooperative research should be described clearly in the proposal.

Additional eligibility criterion: The requested EU contribution must not exceed EUR 1 800 000 per project.

Funding scheme: Small or medium-scale focused research projects.

Expected impact: One or both of the following: (i) Development of technologies for the production of custom-made structures for the repair or regeneration of human tissues; and (ii) Improved manufacturing and performance of custom-made scaffolds for tissue repair or regeneration in the medium to long term. *Additionally:* (iii) More robust European - Chinese research cooperation; (iv) Successful joint research, activities, publications, and contributions to scientific events; and (v) More intensive exchange and training of researchers.

NMP.2013.2.2-3 Wide band gap semiconductor materials and structures for power electronics in energy technologies

Technical content/scope: Technologies for energy generation (notably photovoltaics and wind power) or electricity transport and transformation between the grid and the systems would considerably benefit from the widespread use of reliable and low-cost power electronics devices, e.g. for making significant energy savings. Currently, power electronic devices based on wide band gap materials show the greatest market potential. However, not all materials have yet reached the technological maturity to lead to their breakthrough. This is recognised by the industrial initiatives in the European Strategic Energy Technology Plan (SET-Plan) on these technologies as described in the Materials Roadmap enabling Low Carbon Energy Technologies¹⁷. In particular, new cost-effective materials, architectures, and processes are crucial for the next generation power electronics.

Research proposals should address the development of advanced, cost-effective, sustainable (non-critical) materials, architectures, and processes for power electronics suitable for use in energy technologies. The proposed solutions should demonstrate to cope realistically with the particular and stringent demands of envisaged energy applications in terms of operational characteristics, e.g. required voltage, current levels, or switching frequencies, as well as in long term maintenance-free operation in environments particularly hostile to electronics. This calls for, *inter alia*, the development of materials but also the optimisation of the bonding between semiconductor-metal interfaces to improve their resistance against mechanical stress or deep thermal cycling. The environmental sustainability of each proposed solution should be assessed with special emphasis on efficient materials usage. Proof of concept in terms of product and/or process should be delivered within the project, excluding commercially usable

¹⁷ SEC(2011)1609

prototypes (in compliance with European Commission Communication 2006/C323/01), but convincingly proving scalability towards industrial needs. Dedicated multiscale modelling, tailored (e.g. interface) characterisation, standardisation and/or the production of (certified) reference materials may also be addressed as an integrated part of the research proposal. In order to ensure the industrial relevance and impact of the research efforts, the cost effectiveness and commercial potential of the innovative technologies compared to state-of-the-art solutions currently available on the market should be quantitatively monitored during the project. The active participation of end users as well as stakeholders involved in energy technologies represents an added value and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding scheme: Large scale integrating collaborative research projects.

Expected impact: One or more of the following: (i) Increasing the reliability and operational lifespan of components under realistic conditions; (ii) Considerable improvement of the operation of power-electronic devices, based on the properties of the materials, architectures, or processes; (iii) Improving the cost effectiveness, including maintenance intensity; (iv) Developing manufacturing concepts for the construction of components with less production defects; (v) Improving material use efficiency; (vi) More favourable cost/efficiency ratio; and (vii) Contributing to the objectives of the SET-Plan.

NMP.2013.2.2-4 Materials solutions for durable energy-harvesters

Technical content/scope: Many applications that need low power are now equipped with a primary battery that needs replacement or makes the device obsolete when exhausted. Energy harvesting technology is increasingly becoming more attractive for a wide variety of self- or low-powered applications, especially with advances in microelectronics and micro-electromechanical systems. For instance, secondary micro-batteries in combination with energy harvesters based on photovoltaic, thermoacoustic, thermoelectric, pyroelectric, mechanical/vibrational and electromagnetic sources can offer interesting opportunities to reduce the dimensions of the storage system and enhance the lifetime of the application.

Research proposals should address the development of energy harvesting and storage materials for low-power and/or pulsed applications, for example autonomous nano/microdevices, medical implants, smartcards, sensor networks which would lead to a quantifiable advancement on the state-of-the-art. The estimated improvements in output from the harvester, efficiency, reliability and lifetime of the device, technology cost effectiveness, commercial potential, and adequate availability of energy sources for the proposed application should be convincingly assessed in the proposal. Environmental and end-of-life issues should be addressed. Solutions that optimise the size of the harvester with respect to the device and the number of required peripheral components are welcome. Energy harvesting from multiple sources can be considered. Multidisciplinary approaches between physicists, modellers, chemists, engineers and end users are encouraged.

In order to ensure industrial relevance and impact of the research effort, the active participation of industrial partners represents added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Proposals focusing on the development of organic photovoltaic materials should be addressed to topic NMP.2013.4.0-2.

Funding scheme: Small or medium-sized collaborative projects.

Expected impact: (i) Harvesting material(s) that will significantly improve the efficiency of the devices; (ii) Storage materials that will improve the performance and durability of the devices in terms of power density, capacity and/or energy density; and (iii) advancement of cleaner energy technologies in Europe.

II.2.3 Structuring actions

To contribute more effectively to industrial innovation in Europe, NMP-Materials should also have a structuring effect, building up and exploiting the potential of the European Research Area or – in selected fields – acting at an international level. Actions will be supported to network actors of research and innovation, or to create new synergies. The cross-sectoral nature of materials research and the widespread impact of its applications create obvious links with the other Themes under the Specific Programme 'Cooperation'.

The increasingly important international dimension of industrial research requires a proactive approach to working with third countries in the field of materials research. International cooperation activities are, therefore, an important issue, in particular for those research areas where there is clear mutual benefit in terms of knowledge generation and market expansion. Specific actions may be foreseen, such as joint research activities that may be implemented via coordinated calls to address objectives of mutual interest. This may be of interest, in particular, in the case of industrialised countries and those having signed an S&T cooperation agreement which includes the materials field. In addition, specific Support and Coordinated Actions can promote better links with international co-operation partner countries. These activities will also support, and contribute to, a variety of other European policies as described in the topics.

NMP.2013.2.3-1 Advanced materials – our allies for a sustainable future

Technical content/scope: Materials play a key role in industry and society, enabling changes and progress, thus contributing to the generation of growth and the creation of wealth and jobs in Europe. Mastering the properties, design, production, reuse or recycling of materials and creating new and improved ones is determinant for achieving the goals of the European Innovation Policy, in agreement with the European Strategy for a smart, sustainable and inclusive growth – Europe 2020. New materials enable industrial and commercial success for both existing and not-yet-existing products and processes. They introduce new functionalities and improved properties adding value to existing products, thus representing an invisible revolution in existing industrial productions. They also allow the conception and realisation of fully new products and processes, which are more competitive and sustainable. But do European citizens know enough about materials? Different studies and surveys indicate that the workforce demand related to technological developments in companies involved in the development and use of new materials will increase. Are our citizens sufficiently aware of this?

The proposed support action(s) should deliver media product(s) for a general public, often scientifically unprepared, presenting new materials (including nanostructured materials) and how they have helped, are helping and/or will help creating in Europe and world-wide an industrial economy that serves citizens better and is more favourable to the environment. One or more television productions, or a series of them, is a non-binding example of a product that is expected under the present call. While highlighting the importance and the positive contribution of new materials for our future sustainable industrial economy, propaganda tones should be avoided, and the issues should be presented responsibly and in a balanced way,

including challenges, debates or still-existing critical aspects where appropriate. An interaction with local, regional or national authorities, science organisations, occupational health and safety organisations, expert institutes, social scientists, non-governmental organisations and other stakeholders can be considered, where this is relevant. A product dedicated specifically to children and younger people with the objective of attracting their interest to materials and its research would also be eligible within this call. Messages should be tailored to the needs and knowledge levels of specific audiences. An additional point that may be considered is that new materials (e.g. originating from converging technologies) put new requirements on educational institutions that have to train future workers and provide for future skills needs. The distribution of the media product(s) should be part of this action. In order to maximise the impact of this action, the active participation of scientific journalists represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding scheme: Coordination and support actions (support action).

Expected impact: One or more of the following: (i) Increased awareness of Europe's citizens of materials science and its importance; (ii) A more positive attitude in Europe towards science, research and innovation in new materials; and (iii) Support of the relevant activities of various stakeholders such as researchers, industrialists, trainers and/or schools.

NMP.2013.2.3-2 Rational design of functional materials: networking and sharing of best practices

Technical content/scope: The capacity of conceiving and producing *materials by design* from an atomic or molecular level understanding will make it possible to fully master future industrial productions and optimise their sustainability. Overall computational materials science has greatly progressed and should now more and more strive to expand from explaining behaviours to being a predictive tool to drive both materials research and development of novel and/or improved applications. With the recent advances in parallel computational power and availability, predictive multi-scale material modelling has the potential to grow stronger with the result of enabling a more systematic and faster development of efficient, economically viable and environmentally friendly materials, processes and products.

The proposed coordination action(s) should network stakeholders allowing them to benefit from sharing knowledge in the emerging field of multi-scale computational design of functional materials, the so-called *materials by design*. To accelerate progress and increase impact, the proposals should include activities to promote a deeper understanding between the different communities (atomic, molecular, meso-/macroscale, academia and industry) which may use very different tools/methods and have different expectations and requirements. Considerations of the needs of harmonisation and standardisation of protocols and databases can be included. The proposals can take into account the importance of relevant computational methods and software developments at international level, thus the inclusion of international aspects and involvement of international stakeholders' networks (such as e.g. those resulting from the US *materials genome initiative*) will be given positive consideration under evaluation of Implementation and Impact. To boost the impact of these efforts the proposals can include networking activities such as workshops and training events.

Funding Scheme: Coordination and Support Actions (coordination action). Not more than one coordination action will be funded.

Expected impact: One or more of the following: (i) Increased market impact of *materials by design*; (ii) Improved coordination between basic research and innovation actions in the field of computer based design of materials and training for the next generation of computational material scientists; (iii) Clear strategies for industrial take-up of novel technologies and materials; and (iv) Increased efficiency and effectiveness of the international research activities and open-source software developments in this field.

II.3 Activity 4.3 New Production

The approach remains focused on the transformation of EU industry from a resource intensive to a sustainable knowledge-based industrial environment. This entails creating the appropriate conditions for continuous innovation (in industrial activities and production systems, including design, infrastructure, equipment, and services) and for developing generic production 'assets' (technologies, organisation, production facilities and human resources), while also meeting overall industrial safety and environmental requirements. Particular attention should be paid to promoting activities which support the adaptation and integration of SMEs to the new needs of the supply chain as well as to giving an impulse to the innovation in SMEs and the creation of high tech SMEs.

The research content in this activity is heavily influenced by the Public-Private Partnership initiatives adopted within the framework of the European recovery package. Many topics which will be covered by the PPP initiatives are relevant to the scope and objectives of the New Production activity of the NMP Theme. The following topics, which do not fall entirely within the PPP initiatives, remain under the New Production activity.

NMP.2013.3.0-1 Tools for Monitoring and Assessing Resource-efficiency in the Value Chain of Process Industries

Technical content/scope: Resource-efficiency goals encourage businesses to look for environment-related improvements that yield parallel economic benefits. These business opportunities should allow companies to become more competitive and more environmentally responsible by safeguarding key natural resources. The commission has therefore included resource-efficiency among the Flagship Initiatives of the Europe 2020 strategy. The transition of energy-intensive process industries towards resource-efficient economic sectors requires breakthrough solutions. Robust methodologies, models and tools will therefore be required, taking into consideration reuse and valorisation potential of resources along the value chain. The focus is on continuous processes, with a precise control of conditions, which also ensure product quality and safety of operation.

Research activities should address all of the following areas:

- Status of existing monitoring and modelling tools;
- Re-usability and valorisation of resources as input-sources;
- Integration of the tools into the process control systems;
- Resource-specific indicators to evaluate how negative environmental impacts have been decoupled from resource use;
- Integration of the value chain and include impact assessment studies to evaluate environmental and economic impacts as well as the suitability of the innovative technologies for application within the EU; and
- Innovation in the analytical systems.

In addition, the proposals are expected to include innovation related activities such as demonstration, including pilot implementation in industrial settings, and need to show a clear application potential in the medium term.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Innovations exclusively addressing water efficiency in industry or minerals processing are not covered in this call topic, since these areas were specifically addressed in previous calls.

Funding Scheme: Small or medium-sized collaborative projects.

Expected impact: (i) Reduction of overall waste production and improvement of resource efficiency, through a more efficient input of materials and recycling processes and cleaner working environments; (ii) Competitiveness of greener process industries; and (iii) Standardisation of indicators for environmental performance.

NMP.2013.3.0-2 Integrated processing and Control Systems for Sustainable Production in Farms and Forests

Technical content/scope: Further optimisation of the agriculture/forestry production of food, feed, bio-energy, lumber and biomaterial towards overall sustainability and efficiency is a key pillar of the European Union economy and social development. Some major improvements in production efficiency have already been made by applying Variable Rate Technologies, Global Positioning Systems and similar technologies to agriculture and forestry. However, these technologies are still broadly independent and mainly represent singular solutions for solitary machines or small machine sub-systems. A breakthrough towards overall sustainability would require integrated processing and control systems for the automation of interactive reprogrammable production machines in rural areas. In this integrated automation, improvements in system architecture, equipment, sensor technology and real-time analysis will enable production equipment, whether stationary or mobile, to be managed automatically. By incorporating the traceability of products the new production equipment will contribute to enhanced product quality, safety and a lean supply chain.

The research should lead to an innovative model-based control of the crop- and/or forest-related economic processes. The models will need to make use of a large amount of information from manifold sources. Therefore innovative solutions to handle the data need to be developed. A system, integrating hardware and software, needs to be developed, using the new information based equipment control systems with autonomous operation of multi-machine processes.

These complex machine systems will also need to include new principles for effective Human Machine Interfaces (HMI) to guarantee easy and safe use in all potential situations. HMI will be integrated so that more complex and intelligent equipment could be adapted readily to specific working environments and users' requirements.

For the rapid introduction of the new sustainable technologies, the systems approach should be implemented and demonstrated, for stationary and mobile equipment in an agricultural or forestry environment.

In order to ensure an efficient implementation and maximum impact of SME-related activities, the leading role of SMEs with R&D capacities will be evaluated under the criteria 'Implementation' and 'Impact': the coordinator does not need to be an SME but the participating SMEs should have the decision making power in the project management; and the output should be for the benefit of the participating SMEs and the targeted SME dominated industrial communities.

Funding Scheme: SME-targeted collaborative projects.

Expected impact: The resulting new system technologies are expected to enhance the whole production process (arable and livestock feed farming, forestry and related production sectors), leading to: (i) Improved productivity including optimised resource efficiency and reducing total efforts and inputs (work, energy, protection chemicals, fertilisers etc.); (ii) Improved sustainability including minimising soil damage and improving soil health, maximising water conservation and resource protection; (iii) Increased quality, safety and marketability of food, bio-energy, biomaterials and lumber products; (iv) A world-leading position for the European forestry and agricultural machinery industry; and (v) Benefits for European rural areas.

II.4 Activity 4.4 Integration

The integration of knowledge and technologies of the three areas of research above is essential in order to speed up the transformation of European industry and its economy, while adopting a safe, socially responsible and sustainable approach. The research will focus on new applications and novel, step-change solutions responding to major challenges, including the RTD needs identified by the different European Technology Platforms.

This research should enable and sustain the knowledge-based transformation of current industrial sectors and the development of new science-based sectors through the integration of new knowledge from nano-, materials-, and production technologies in sectoral and cross-sectoral applications. The RTD approaches and objectives applied by the partners should lead to results (products, processes, methods, etc.) and impacts observing the guidelines of the sustainable development paradigm, namely the public health, worker safety, environmental protection and the societal dimensions, including governance concerns (public awareness and acceptance). Furthermore this research work should offer opportunities for Europe to consolidate the optimal normalisation and standards needed.

Several cross-cutting dimensions could be considered while handling the vast array of sectors and applications and could further inspire the emergence of topics:

- **Transforming traditional industry**, which faces the challenge of low-cost competition, as well as rapidly changing market expectations and behaviour. It should increase its productivity through new processes, high-added value products and new business models;
- **Fostering scale-intensive and specialised suppliers industry** through the adoption and integration of new advanced technologies thus enabling the improvement of its leadership in the global market;
- **Promoting Science-based Industry** which will play a key role in establishing a high-value European industry. It will need the integration of most of the advanced technologies dealt with in Nanotechnologies, Materials and Production activities, enabling the development of new, high value, products and services, processes and even leading to new industries.
- **Towards a sustainable supply industry** is another key objective in supporting product and productivity innovation, especially for sectors with a large environmental impact.

NMP.2013.4.0-1 Graphene production technologies

Technical content/scope: Graphene and graphene-based materials have undergone a rapid development in recent years. Although there is a general consensus that they are very promising, they have not yet arrived at the stage of industrial applications. A concentrated effort is necessary in order not to lose Europe's leading role in terms of research capacity in the field, and to pave the way for industrial innovation. A recent workshop on the future of graphene (Graphene 2020¹⁸) gave an overview of its numerous possible and probable applications, such as e.g. printed electronics, photovoltaics, supercapacitors, light composites,

¹⁸

http://ec.europa.eu/research/industrial_technologies/conferences-proceedings_en.html

medical sensors etc. However, one of the major bottlenecks is still the industrial-scale, reliable, economical and sustainable production of graphene for these potential applications. Research proposals should focus on technological advancements for the development or up-scaling of production methods and techniques of monolayer or few-layer graphene, functionalised graphene, or graphene nanoribbons, aiming at improved throughput, targeting high yield, homogeneity and reproducibility and low-cost. In-situ monitoring methods allowing direct control of the graphene manufacturing process may also be addressed. One or more applications should be addressed, e.g. lightweight composites, coatings, flexible and printed electronics, supercapacitors and flexible batteries, sensors, catalysis or lighting. The materials science necessary to understand the factors that are key to controlling the relevant in-service properties of graphene (such as e.g. its reported high mobility, conductivity or stability of dopants) and its growth on different substrates or matrices, e.g. by Chemical Vapour Deposition but also by other chemical or physical routes – including subsequent lift-off and handling if necessary – may be addressed. Proof of concept in terms of product and/or process should be delivered within the project, excluding commercially usable prototypes (in compliance with European Commission Communication 2006/C323/01), but convincingly proving scalability towards industrial needs. Proposals should also include cost/benefit calculations for sample potential applications, demonstrating economic viability and adapted risk management. The development of final applications is outside the scope of the topic. Pre-normative activities may be included.

Process safety should be duly addressed. Subsequent steps, e.g. handling, packaging and transport, may also be addressed. In order to ensure the industrial relevance and impact of the research efforts, the active participation of industrial partners represents an added value to the activities, and this will be reflected in the evaluation, under the criteria Implementation and Impact.

During negotiations, possible interactions with the relevant activities of a FET-flagship action devoted to graphene, *should one exist*, will be taken into account.

Funding scheme: Large-scale integrating collaborative research projects.

Expected impact: (i) Robust, reliable, cost-effective and fast processes capable of fulfilling all requirements for large volume production of functional graphene; (ii) volume processes that are capable of being integrated in appropriate manufacturing; and (iii) increase of the competitiveness of European industry.

NMP.2013.4.0-2 Innovative materials for efficient, stable and cheap organic photovoltaic cells

Technical content/scope: Organic photovoltaic (OPV) cells are photovoltaic (PV) cells, based on organic semi-conductor materials, which produce electricity upon light absorption. They have great potential to become flexible and economical power sources tailored to different applications ranging from small devices to public utilities. The highest independently confirmed power conversion efficiency for organic thin film PV cells has reached 10% (December 2011). OPV cells can be produced using low-cost mass production processes such as sustainable printing techniques, albeit currently still at the expense of their stability. Moreover, thanks to the wealth of possible organic compounds, there are no intrinsic limitations for the availability of the photo-active materials. Up-to-date OPV cells are still mainly in the development phase with relatively few industrial or commercial initiatives as technological hurdles, especially in terms of materials and material properties, still remain to be solved.

Research proposals should address the development of innovative materials that convincingly demonstrate the cost-effective production of industrial modules which promise to be commercially competitive for well-defined applications in the next decade. Materials research can thereby lead to novel organic semiconductors with an improved thermal and photochemical stability in combination with a higher power conversion efficiency, e.g., by a better control of the band-gap. A better understanding of the long term stable operation and the degradation mechanisms at the material level can contribute to increasing the lifetime of the cells, which should be targeted. Since the attractiveness of OPV materials resides in the combination of enhanced performance, flexibility and economically interesting processing technologies, proposals could also cover advances in, e.g., non-vacuum coating and printing techniques. The environmental sustainability of each proposed solution shall be assessed with special emphasis on efficient materials usage. Dedicated modelling, standardisation and/or the production of (certified) reference materials may also be addressed as an integrated part of the research proposal. The performance of the OPV materials should be demonstrated in an environment relevant to its future application, displaying a clear improvement with respect to the current state-of-the-art.

In order to ensure industrial relevance and impact of the research effort, the active participation of end users represents added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding scheme: Small or medium-sized collaborative projects.

Expected impact: All of the following: (i) Efficiency of an OPV module of at least 15% in a relevant environment, with a considerable improvement in the service life-time, performance of the materials to be credibly planned to be reachable by 2030; (ii) Improvement in efficiency of material use and/or the OPV production processes; (iii) More favourable cost/efficiency ratio compared to inorganic PV; and (iv) Contributions to the implementations of the SET plan, in particular to the Materials Roadmap enabling Low Carbon Energy Technologies¹⁹.

NMP.2013.4.0-3 From research to innovation: substantial steps forward in the industrial use of European intellectual assets, stimulating the use of newly developed materials and materials technologies by the industry

Technical content/scope: We know that innovation may lag behind after research results have been achieved. In particular, SMEs may miss opportunities of business; this is because of various reasons: undercapitalisation, lack of suitable human resources etc. In other cases, research brokers may be needed who scout and advise SMEs on existing IPR and who can prepare economic and technical scenarios to help the SMEs to improve their product(s) and/or production. The complex path from research to innovation needs boosted impetus. Often original research has been co-funded by the EU Framework Programmes or by European National schemes, so that missing the exploitation of research results might represent an underperformance for public expenditures. Moreover, significant untapped innovation potential may exist in research carried out in Member States of more recent accession to the European Union. This call aims to stimulate and support the use of newly developed and IPR-protected materials and materials technologies, fostering innovation and their integration into future industrial production.

¹⁹ SEC(2011)1609

The proposals should involve innovation-oriented research in materials and materials technologies, further developing existing IPR-covered results, scaling them up to a prototyping or pilot stage. The consortium should demonstrate ownership of or exclusive rights to use the relevant IPR; the relevant IPR should be in the form of patents granted by the European Patent Office (EPO) or by national patent offices established in EU Member States or in Associated Countries. Proposers should demonstrate that the overall IPR situation is compatible with future commercialisation of their technology and prove the technical and economic viability of their approach. The consortium should also demonstrate appropriate knowledge on materials science and engineering as well as on the ways to manufacture the materials. Successful projects should prove the technological and economical viability of the solutions proposed. A business plan should be part of the final report. One or more of the following ancillary activities may also be included in the project – this list is not exhaustive, and is only given as an example: detailed market studies, scouting of SMEs or research organisations, evaluation of the success factors in the industries involved, educational courses, infrastructure use, insertion of qualified personnel (at least from the post-graduate level) into SMEs, specific regulatory survey, clinical trials, insurance issues, life cycle assessment studies etc. In order to ensure the largest possible impact, proposers should soundly detail the market perspectives and the potential for economic growth and jobs, and this will be reflected in the evaluation under the criteria Implementation and Impact.

Funding Scheme: SME-targeted collaborative projects.

Expected impact: One or more of the following: (i) Realise cases where research results are used by new or existing industries; and/or the 'European paradox'²⁰ and the 'valley of death'²¹ are overcome; (ii) Creation of new businesses in Europe; (iii) Exploitation of research results; and (iv) Growth and jobs.

NMP.2013.4.0-4 Support for cluster activities of projects in the main application fields of NMP Theme

Technical content/scope: In FP7 the implementation focus has gradually shifted towards promising application areas. The potential of forming application clusters exists, in order to create additional synergies. Because of the multi-disciplinary nature of the applications, often also involving other KETs, this clustering approach could bring about benefits through cross-fertilisation (e.g. reporting of technological progress; exchange or licensing of IPR) and identification of value chain elements required for industrial success. Activities could also include roadmaps for large-scale demonstration and pilot-line activities, as well as other support activities that would be required, e.g. forming of industry alliances, pre-commercial procurement and (formal or industrial) standardisation. The final target is to tackle the bottleneck for the deployment in Europe of new and promising technologies, in order to foster innovation in products and/or processes and/or the sustainability of our industrial economy.

Funding Scheme: Coordination and Support Actions (coordinating actions).

Expected impact: One or more of the following: (i) Facilitating and speeding up the industrial exploitation and success of existing research results; (ii) Building up of networks and alliances for further R&D+I and industrial innovation; (iii) Additional added value

²⁰ European Commission Green Paper on Innovation,
http://europa.eu/documents/comm/green_papers/pdf/com95_688_en.pdf

²¹ See e.g. Final Report of High-Level Expert Group on Key Enabling Technologies,
http://ec.europa.eu/enterprise/sectors/ict/files/kets/hlg_report_final_en.pdf

beyond the original scope of projects; and (iv) Carrying out feasibility analysis and building readiness towards possible future large-scale demonstration and pilot line activities.

NMP.2013.4.0-5 Deployment of societally beneficial nano- and/or materials technologies in ICP countries

Technical content/scope: The potential of nano- and/or materials technologies to address major societal challenges, e.g. in health, energy and environment is widely recognised and several leading industrial nations are actively pursuing significant R&D&I programmes for accelerating the deployment of nano- and/or materials technologies in societally beneficial applications. Nanosciences and nanotechnologies: An action plan for Europe 2005-2009 emphasised the importance of international cooperation with less industrially advanced nations in order to secure their access to knowledge and avoid any ‘nano divide’. NMP-Materials has created a particularly positive momentum with its calls with Africa, Middle-East Countries, Latin America, Eastern European Countries and South East Asia.

The goal of this topic is to support sustainable development in ICP countries through the deployment of societally beneficial nano- and/or materials technologies. The methods and solutions need to be tailored to meet the specific needs and circumstances using local knowledge and innovative ability, so that they will be adopted.

Activities may include, but are not limited to:

- Identification of tangible opportunities for pooling knowledge in the fields of: healthcare, clean energy, environment (including water);
- Networking of technology providers, representatives of ICP countries (scientists, industrialists, civil society representatives, decision makers) and potential sponsors for the development of implementation mechanisms (including appropriate business models);
- Education, training and exchange of scientists in the underlying technologies aiming at ensuring the sustainability and further development of the proposed solutions;
- Organisation of a series of events.

Proposals specifically addressing materials technologies may target networking of research projects funded at EU or National (EU and non EU) level as well as the creation of an open database of researchers; these two target issues are not called for in the case of nanotechnologies because dedicated measures are currently in place.

In order to create a particular benefit in the interaction amongst ICP countries, broad geographic areas and not individual countries should be addressed. The targeted geographic areas are:

- Eastern Partnership countries
- Mediterranean countries
- African countries
- Latin American countries
- ASEAN

A proposed support action may address one or more of above-mentioned geographic areas.

Funding Scheme: Coordination and Support Actions (support actions).

Expected impact: One or more of the following: (i) Support the development and promotion of concrete projects making the benefits of new technologies; (ii) Contribute towards the United Nations Millennium development goals; and (iii) Contribute towards building and strengthening of science in low and middle-income countries through entrepreneurship.

NMP.2013.4.0-6 Safe Life Extension management of aged infrastructures networks and industrial plants

Technical content/scope: In Europe many industrial facilities, such as power production plants and large chemical installations, as well as infrastructure network elements, like bridges, tunnels and railway systems, are reaching the end of their designed operational life time. New ways to extend the service life of current infrastructure networks and industrial plants without jeopardising their safety requirements need to be investigated in order to guarantee a decrease of major accidents in the industry and major disruptions of economic activity. Safe life extension becomes even more critical when the structure is part of an interconnected infrastructure network, is located in an urban area where the related environmental impacts are amplified, or is at risk due to more frequent climate-induced extreme events.

Areas of investigation to be addressed include new risk-based inspection technologies, innovative reliability-based solutions, comparison between deterministic and probabilistic approaches, influence of degraded physical state on potential domino effects, and resilience. Methods and technologies vary between industrial sectors and therefore a benchmark study is necessary to understand the practices in the various industries and Member States, and to prepare the deployment of best practice solutions in Europe without compromising on safety and sustainability. In addition to the technical approaches, barriers linked to financing, risk insurance, decision making, public acceptance and regulations need to be addressed. Safety risks have to be identified locally (at element level) and globally (at network level, taking into account the interconnection).

Deliverables should also include benchmarking with best practices outside Europe, and therefore this topic is particularly suitable for collaboration with partners from outside Europe.

Additional eligibility criterion: The requested EU contribution must not exceed EUR 1 000 000 per project.

Funding Scheme: Coordination and Support Actions (coordination action). No more than one coordination action will be funded.

Expected impact: (i) Improved synergy amongst major stakeholders in safe life extension; (ii) Identification of best practice solutions and research needs; (iii) Strategies for the systematic implementation of comprehensive life time extension solutions at European scale; and (iv) Significant contributions to new standards for life extension

NMP.2013.4.0-7 ERA-NET to support Innovation in the NMP thematic area

Technical content/scope: The objective of the Innovation Union is to improve framework conditions and access to finance for research and innovation so as to ensure that innovative ideas can be turned into products and services that create growth and jobs. Excellent research should have more opportunities for moving into the next stages of the innovation cycle.

The NMP Theme has funded and continues to fund a number of successful ERA-NET and ERA-NET Plus initiatives, whose aim is to coordinate the research efforts of the participating

Member States and Regions in the field of Industrial Technologies and to implement joint transnational calls for innovative research initiatives. This has resulted in a large number of transnational projects funded by the participating Member States and regions, many of them with a strong SME participation.

The aim of this ERA-NET is to build upon those efforts to commercialise research results. This ERA-NET concentrates on second-stage research and innovation funding such as proof of concept, prototypes, scale-up studies, performance verification, reliability and viability of products. The objectives are

- to detect NMP research results likely to provide solutions for innovative products, processes or services;
- to analyse and assess the lessons from the measures taken and supported in various Member States to exploit transform research results; and
- to provide operational guidance for supporting efficiently the successive steps between research and innovation, paying particular attention to the use of Regional Development Funds, in the context of smart specialisation strategies.

The ERA-NET will complement the activities of existing ERA-NETs in the NMP field, in particular by helping to capitalise on their portfolios of successful projects. The proposed ERA-NET should therefore ensure a broad coverage of relevant Member States and regions and expand towards programmes or activities that cover the innovation aspect.

Proposals should focus on:

- Systematic exchange of information and good practices on existing programmes and experiences concerning exploitation and commercialisation of research results, and use of the Regional Development Funds for research, innovation and business development;
- Definition and preparation of common strategic activities;
- Implementation of joint activities between national and/or regional programmes;
- Funding of joint transnational research and innovation activities closer to the market.

The outcome of this topic could serve as input for the planning of further activities under Horizon 2020.

Funding Scheme: Coordination and Support Actions (coordinating actions).²²

Expected impact: (i) Improve the efficiency of the process transforming research results into exploitable results in NMP; (ii) Disseminate and share good practices in supporting downstream research activities; and (iii) Inform policy development for Horizon 2020 and regional programming.

NMP.2013.4.0-8 The impact of the integration of key enabling technologies on industrial production and societal goals

Technical content/scope: To ensure European industrial production remains innovative and competitive at international level it will need to develop the competences to exploit multiple and integrated key enabling technologies (KETs), defined as micro- and nanoelectronics,

²² This topic is for an ERA-NET. Only ERA-NET eligible partners can participate. The minimum number of participants is set at three independent legal entities managing publicly funded national or regional programmes, each of which is established in a Member State or Associated Country. Please refer to Annex 4 of the Cooperation work programme, including the Call Fiche FP7-ERANET-2013-RTD.

photonics, nanotechnology, biotechnology, advanced materials and advanced manufacturing systems.

In developing the research and innovation programme, more emphasis is being put on innovation activities closer to market, e.g. demonstration projects, pilot lines and validation. The exploitation of single or multiple of KETs may require new and different business models and networking capabilities.

Understanding how effectively these multidisciplinary, knowledge and capital-intensive technologies are currently integrated, at global level, in different innovation cycles and value chains in European industrial production is a crucial starting point. The return on investment, based on tangible outcomes such as products, services and solutions in industrial, societal and novel applications, of existing and emerging business approaches to integrate KETs will provide a baseline on which future developments can be assessed.

The philosophy and underpinning building blocks emerging from the analysis should provide the knowledge and tools for EU industry to adopt new, adaptive business models, networks and configurations to optimise the integration of KETs. Furthermore, the approaches to integrate KETs should lead to a new model for European industrial production, based on more sustainable production and consumption patterns, supporting the pursuit of Sustainable Globalization and Sustainable Development.

The analysis should lead to:

- Existing good practices in the integration of KETs;
- Barriers (technological, economic, regulatory, organisational, social, cultural) to the integration of KETs and their take-up in industrial and societal applications;
- Evidence of innovative business models and adaptations in the structure of organisations to effectively manage the integration of KETs, for a globally competitive and sustainable European manufacturing industry.

Additional eligibility criterion: The requested EU contribution must not exceed EUR 1 000 000 per project, and the project duration must not exceed 18 months.

Funding Scheme: Coordination and Support Actions (support actions). No more than one support action will be funded.

Expected impact: (i) Improved understanding of the current situation and future perspectives for integrating key enabling technologies, and their application to different industrial and societal applications; and (ii) Orientations on the approaches and measures that could be adopted to facilitate the integration of key enabling technologies.

NMP.2013.4.0-9 Organisation of events, including those related to the Presidencies of the European Union

Technical content/scope: An integral part of the NMP Theme's activity is to organise events of a major strategic nature. Examples are events organised together with successive EU presidencies; and also EuroNanoForum, Manufuture, NMP Conferences and World Manufacturing Forum. The proposed Support Action(s) should contribute to creating better synergy between initiatives launched by the Commission and by the Member States, to the benefit of the coherence of the overall actions within the field of research and innovation in industrial technologies as intended in FP7-NMP. Member States which will hold a forthcoming Presidency of the European Union are Greece and Italy (2014 Presidencies) and they may be particularly interested in this topic. In order to ensure high political and strategic

relevance, the active involvement of the competent National Authority(ies) will be evaluated under criteria 'Quality' and 'Impact'. The proposed Support Action(s) should address topics that are of high relevance at the date of its taking place. An appropriate equilibrium should be present in the proposed action(s), with balanced presentations of various research and industrial elements and points of view. Participation of non-EU actors is possible. Outreach activities may be included, such as a press programme or events dedicated to the wider public or schools.

Funding Scheme: Coordination and Support Actions (support actions).

Expected impact: One or more of the following: (i) Review of research, industrial and/or societal developments linked to the NMP areas, as appropriate; (ii) Sharing of information and comparison of points of views; and (iii) Networking various stakeholders and supporting their activities, e.g. natural scientists, social scientists, researchers, industrialists, investors, environmentalists, museums and schools.

II.4.1 Raw materials

Raw materials are essential for the sustainable functioning of modern societies. Access to, and affordability of, mineral raw materials are crucial for the sound functioning of the EU's economy and the competitiveness of European industry. For this reason, this work programme, and the previous one, place renewed emphasis on raw materials. The topics in this section contribute to the aims of the proposed European Innovation Partnership (EIP) on Raw Materials.²³

NMP.2013.4.1-1 Development of new materials for the substitution of critical metals – coordinated call with the Japan Science and Technology Agency

Technical content/scope: Many technologies with significant socio-economic benefits face material requirements that are, or will be, negatively affected by demand-supply disruptions. Research is needed in particular to improve our fundamental understanding of the development of new materials, with a completely eliminated critical metal content that could ultimately be used in highly performing products.

Projects are called for to investigate the development of such materials by rational design, with focus on the interplay between theory and/or large-scale computational screening and experimental methods. The synthesis or fabrication of nano- or microstructures with enhanced functionality as well as the use of advanced characterisation and measurement methods to determine how effects at the nano- or micrometre-level influence the materials' behaviour at the macroscopic level, should also be an integral part of the proposal. Aspects related to the recyclability of the materials can be addressed.

Projects should foresee the recruitment of researchers in the early stages of their career.

This call targets a balanced participation from European and Japanese organisations in each project. In order to assure genuine EU-Japanese cooperation, it is important that the proposed research plan properly includes integrated and coordinated research activities between the EU and Japan. The establishment of a close collaboration between European and Japanese partners is mandatory, and *proposals not including such collaboration will be deemed ineligible*.

Additional eligibility criterion: The requested EU contribution must not exceed EUR 1 800 000 per project.

Funding scheme: Small or medium-scale focused research projects.

Expected impact: (i) Improved understanding of the development of materials for the substitution of critical metals for a well-defined technology; (ii) Improved performance of industrial products in the longer term; (iii) More robust European – Japanese research cooperation; (iv) Successful joint research, activities, publications, and contributions to scientific events; and (v) More intensive exchange and training of researchers.

NMP.2013.4.1-2 Breakthrough Solutions for Mineral Extraction and Processing in Extreme Environments

Technical Scope/content: As a response to the shortage of some mineral resources on global markets, both the EU Raw Materials Initiative and the Europe 2020 strategy have called for

²³ http://ec.europa.eu/enterprise/policies/raw-materials/innovation-partnership/index_en.htm

improved efficiency in the raw materials supply. Europe has, however, been exploited by mining activities over many centuries and easy-to-access mineral deposits are mostly exhausted.

The biggest opportunities for the access to raw materials within the EU are in areas difficult to exploit, such as at great depth, in the Arctic region of Europe and in extreme marine environments.

Current technologies for mineral raw materials production, including in-situ exploration, are inadequate for these extreme environments (e.g. with high pressures, too high or too low temperatures and environments which are dangerous for humans). Major challenges related to human safety, performance and reliability of technologies, economic effectiveness and environmental efficiency need to be addressed.

The overall objective is to develop new breakthrough cost-effective solutions for environmentally friendly mining and processing under difficult conditions in extreme environments, to further unlock the large potential of raw materials in Europe. These solutions should also consider the sustainable management and possible use of mining and processing waste in extreme conditions. The proposals should take into account environmental issues and risks in the exploitation phase. Deliverables should include wherever possible a field demonstration in order to prove the viability of the developed technological solutions. Consideration should be given to mining concessions, ownership and commercial exploitation rights.

All non-energy non-bio-based raw materials necessary for European industries can be targeted. However, the economic relevance of the selected raw materials needs to be demonstrated and this will be reflected in the evaluation, under the criterion Impact.

In order to ensure industrial relevance and impact of the research effort, the active leadership and participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Relevant existing national or international R&D initiatives and projects have to be reflected in the state-of-the-art description and overlaps with them should be avoided.

This topic is complementary with the topic ENV.2013.6.2-6 on "Sustainable Management of Europe's Deep Sea and Sub-Seafloor Resources", where the emphasis is on assessing the environmental impacts.

Funding Scheme: Large-scale integrating collaborative projects.

Expected impact: (i) Increase access to raw materials via new mining solutions in order to decrease EU dependency on resource imports and to create jobs in Europe; (ii) Strengthen the leadership of the European mining sector and their technology providers; (iii) Create solutions with competitive investment and operational costs and ensuring minimal impact on environment and urban settlements; and (iv) Create inherently safe working and operating environments.

NMP.2013.4.1-3 European Intelligence Network on the Supply of Raw Materials

Technical content/scope: The EU Raw Materials Initiative calls for actions enhancing the knowledge base necessary for an efficient European raw materials strategy, for instance the harmonisation of relevant terminology and standardisation of minerals data or the creation of the 'European Raw Materials Yearbook'.

The EU needs a complete and reliable knowledge base as well as a supply and demand foresight on raw materials for a proper policy making to ensure an adequate access to raw materials.

Raw materials expertise is available in Europe, but is scattered amongst a variety of institutions, including government agencies, universities, NGOs and industry.

The major objective is to create a network to facilitate access for the EU to the raw materials information sources and to promote collaboration among experts.

The Coordination Action should in particular:

- Create a sustainable network gathering a critical mass of institutions with the relevant authority and competencies at world, EU and national levels, resulting in the creation of a permanent body before the end of the project.
- Create a harmonised and standardised EU knowledge base interoperable with national databases including information on primary and secondary resources on land and in marine environment down to 4 km depth, and estimations of the resource availability including urban mines (landfills and mining waste), and contribute to the establishment of the 'European Raw Materials Yearbook' in close coordination with EUROSTAT.
- Produce a foresight study on raw materials supply and demand in the EU, together with competent financial institutions, with special attention given to critical minerals. A strategy for annual updates of this foresight study on raw materials should be included as well.
- Develop a multi stakeholders' Internet portal providing information on the raw materials resources and deposits within European Union.

All presented data and information should conform to the relevant world or European standards and should be of value for decision making related to raw materials.

Industry relevant non-energy non-agricultural primary and secondary raw materials are targeted.

Additional eligibility criterion: The requested EU contribution must not exceed EUR 2 000 000 per project.

Funding Scheme: Coordination and support actions (coordination action). No more than one coordination action will be funded.

Expected impact: (i) Contribute to the successful implementation of the Raw Materials Initiative and related activities; (ii) Create a sustainable network at the EU level with competence in collecting and providing information on raw materials; (iii) Improve harmonisation, standardisation and certification of national primary and secondary raw materials data; (iv) Identify needs for future research & exploration, and green public procurement; (v) Improve coordination in research and innovation actions in the field of raw materials intelligence; and (vi) Formulate the ideas for possible novel actions with high European common interest and increase efficiency and effectiveness of the EU research activities in this field.

II.4.2 "The Ocean of Tomorrow – 2013": Joining research forces to meet challenges in ocean management Fostering research and innovation on marine technologies

Aims of the call: The EU Strategy for Marine and Maritime Research²⁴ supports the EU integrated maritime policy's objective of a thriving and sustainable maritime economy. It is a key component in reconciling the growth of maritime activities with environmental sustainability and thus it contributes to the 'Europe 2020' goal of smart, inclusive and sustainable growth for Europe. In this context, "The Ocean of Tomorrow" calls for proposals aim to foster multidisciplinary approaches and cross-fertilisation between various scientific disciplines and economic sectors on key cross-cutting marine and maritime challenges.

"The Ocean of Tomorrow 2013" third cross-thematic call will focus on marine technologies. The development of competitive and innovative marine technologies is necessary to assess and monitor the good environmental status of the seas, monitor current and new activities and contribute to their sustainable operation. "The Ocean of Tomorrow 2013" call will therefore aim at pooling the efforts of stakeholders from various disciplines and sectors in order to develop innovative marine technologies for a wide range of applications.

Three key areas will be tackled: sensing technologies that are necessary to improve reliable measurements of key parameters in the sea; new materials that can avoid bio-fouling on mobile and stationary structures; and innovative transport and deployment systems for the offshore energy sector.

The call will be implemented jointly between Theme 2 "Food, Agriculture and Fisheries, and Biotechnology" (FAFB), Theme 4 "Nanosciences, Nanotechnologies, Materials and new Production Technologies" (NMP); Theme 5 "Energy", Theme 6 "Environment (including climate change)" and Theme 7 "Transport (including Aeronautics)".

"The Ocean of Tomorrow 2013" call fiche with all relevant information can be found in the Work programme of Theme 2 " Food, Agriculture, Fisheries and Biotechnology" (FAFB), as well as on the Participant Portal under the call page FP7-OCEAN-2013.

OCEAN 2013.1 Biosensors for real time monitoring of biohazard and man-made chemical contaminants in the marine environment

Technical content/scope: Due to growing concerns about the health of the oceans and their capacity to continue to provide resources, goods and services as well as associated risks to the human health, there is an increasing demand for real-time monitoring of the environmental status of marine water quality and the provision of early warning systems. Real-time in situ monitoring of marine chemical contaminants (including emerging pollutants, biohazards e.g. algal toxins) is of utmost importance for the sustainable management and exploitation of the seas and their resources.

Technology wise, marine biosensors have the potential to offer unique features for highly specific and precise measurements, including under multi-stressor conditions, by combining technological elements (including nanotechnologies) and bio-receptors in a single

²⁴ COM(2008)534, Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: "A European Strategy for Marine and Maritime Research: A coherent European Research Area framework in support of a sustainable use of oceans and seas".

measurement device. Thus they could open new avenues to respond to the growing need for accurate real time monitoring of the quality of sea water and marine ecosystems to support relevant EU legislations such as the Marine Strategy Framework Directive (MSFD)²⁵.

Based on most recent knowledge on genomics and physiology as well as on materials, nanotechnology, information technologies and relevant existing detection/monitoring technologies, the research under this topic should aim at developing innovative real-time, in situ biosensors, taking advantage of nanotechnology when applicable. These sensors should target the detection and monitoring of high impact and presently difficult to measure emerging pollutants and other substances, such as algal toxins and their producers, synthetic organics, herbicides/pesticides and persistent organic pollutants (POP), including polycyclic aromatic hydrocarbons (PAH) and should enable early diagnosis of deterioration of the environmental status of the marine waters in multi-stressor conditions.

The proposals should include a test phase to demonstrate the potential of these biosensor(s) for in situ environmental and/or aquaculture related applications. Measurement devices should show ability to compete with/complement non real time alternatives and provide faster, less expensive, and less time-consuming measurements than the currently available instrumental analytical methods. A proof of concept in terms of product and/or process should be delivered within the project demonstrating industrial manufacturability.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*. The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

Funding scheme: Collaborative project. Several projects may be funded within the total budget of the topic (EUR 15 000 000).²⁶

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 25% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected impact: New biosensors in the field of marine environmental monitoring will:

- Enable early detection and more effective monitoring of the marine environment and its status and implementation of appropriate management actions in line with the Marine Strategy Framework Directive (MSFD);
- Improve sustainable management and exploitation of marine resources (such as fisheries and aquaculture) in particular the monitoring of quality of shellfish waters and minimise risks to human health;

²⁵ Directive 2008/56/EC of the European Parliament and of the Council establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), OJ L 164 of 25 June 2008.

²⁶ The contribution of the NMP Theme to this topic is EUR 2 million

- Provide competitive advantage and leadership to European industry, for example within the fields of biotechnology, sensor development, diagnostic technologies and nanotechnology.

OCEAN 2013.2 Innovative multifunctional sensors for in-situ monitoring of marine environment and related maritime activities

Technical content/scope: There is an urgent need to improve the in-situ component of the ocean observing systems to achieve an appropriate and comprehensive understanding of the functioning of the marine environment at different geographic, temporal scales and the monitoring of marine and maritime activities to ensure their sustainable development. As commercially available sensors tend to be too large, expensive, and power-hungry for widespread use, reducing the cost for acquisition of data is a key priority in order to implement EU legislations such as the Marine Strategy Framework Directive (MSFD), the Common Fisheries Policy CFP), support international initiatives such as the Global Ocean Observing System (GOOS) and the Global Earth Observation System of System (GEOSS).

In this context the topic seeks to develop robust, easily usable across multiples platforms, cost effective multifunctional sensors and their packages that provide reliable in-situ measurements of key parameters. Research and demonstration activities under this topic shall address in a comprehensive manner all the following aspects:

1/ Developing cost-effective sensors suitable for large-scale production, taking advantage of "new generation" technologies such as within the fields of miniaturisation, communication, positioning systems, disposable technologies, and IT tools, software, energy storage and usage.

2/ Sensors should be compact, autonomous multifunctional integrated packages that could be deployed using free floating devices or, buoys, platforms, or ships of opportunities including fishing vessels. The sensors must be developed as precompetitive prototypes and field tested in close cooperation with stakeholders such as sensor designers, SME's, managers of monitoring/observing systems, marine industry e.g fishermen and end-users. An essential part of this topic will be to ensure technology transfer through an integrated approach, bridging between laboratory testing and commercially viable product.

3/ Addressing data flow issues, including data acquisition, access and retrieval, storage, transmission, standardisation, and pre-processing. The projects should take advantage of the latest web enablement technology for setting up sensors' networks suitable for open access and data sharing.

4/ Making the sensors fully interoperable with existing observing systems and compatible with standard requirement such as the EU Fisheries Data Collection Framework, the Marine Strategy Framework Directive, the INSPIRE directive²⁷, the GMES and GOOS/GEOSS initiatives.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*. The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

²⁷ Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

Funding scheme: Collaborative project. Several projects may be funded within the total budget of the topic (EUR 15 000 000).²⁸

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 30% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected impact: The projects will:

- Provide a large increase in the temporal and geographic coverage from in-situ marine sensors to enhance the European contribution to Global Monitoring of the Oceans;
- Increase availability of standardised in-situ data that is suitable for integration within key marine observation, modelling and monitoring systems and reduce ocean modelling uncertainty;
- Reduce cost of data collection system in support of fisheries management;
- Advance competitiveness for European Industry's & particularly SME's within the Marine sensing sector;
- Enable better cooperation between key sectors (Manufacturing Industry, ICT, Maritime Industry, Marine Science, Fisheries etc.);
- Support implementation of European Maritime Policies (MSFD, CFP, IMP, etc.);
- Promote new discoveries leading to better understanding of the seas.

OCEAN 2013.3 Innovative antifouling materials for maritime applications

Technical content/scope: Biofouling is a major concern for mobile (e.g. ships) and stationary (e.g. aquaculture cages or offshore power generation systems) maritime structures, sensors and equipments. It negatively affects marine and maritime activities by creating a need for regular maintenance, which is costly, might disrupt operations and is potentially polluting. With the purpose of avoiding toxic biocides and heavy metals used in antifouling coatings, novel alternative cost-efficient and environmentally friendly approaches are needed.

The proposals under this topic should focus on developing new, well beyond the state of the art, antifouling materials and should address in an integrative way mobile and stationary maritime applications.

On the basis of a thorough analysis of the state of the art, research could draw on the whole range of antifouling materials e.g. foul release approach, biomimetics, marine biotechnology based coatings, polymers etc. The proposals should include benchmarking of existing materials, technologies and on-going research. In this sense environmental and economic factors, as well as performance, must be duly considered.

Improvement in the understanding of marine biofouling processes, including their relation with biocorrosion, with respect of the developed materials should be an integral part of the proposals. For the resolution of the technological bottlenecks impeding the achievement of well performing final materials and products, applicants are welcome to investigate and

²⁸ The NMP Theme does not contribute to this topic

exploit the potential offered by converging technologies such as e.g. materials science and engineering, maritime technology, nanotechnology and biotechnology.

The proposals should include relevant field testing for all the selected applications. Development, improvement and/or standardisation of relevant protocols should be included. Proof of concept in terms of product and/or process should be delivered within the project, excluding commercially usable prototypes (in compliance with European Commission Communication 2006/C323/01), but convincingly proving scalability towards industrial needs.

In the case of marine biotechnology based approaches the issues of supply and the need for the biobased active antifouling compounds to be produced in bulk, as required for final commercial production should be given due consideration.

The proposals should follow a life cycle approach for the new materials and their selected applications also taking into account issues of cost efficiency, effective life span, production, handling, maintenance, environmental impact, ecotoxicological profile and end of life. The proposals should include assessment of the environmental, health and toxicological effects according to REACH²⁹, OECD Guidelines for the Testing of Chemicals and/or relevant international standards.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*. The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

Funding scheme: Collaborative project. Several projects may be funded within the total budget of the topic (EUR 15 000 000).³⁰

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 8 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 25% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected impact: The projects will:

- Increase efficiency and competitiveness of maritime activities based on mobile and/or stationary maritime structures (transport, aquaculture, fisheries, marine energy) by reducing operation and life-cycle-costs, negative impacts on the marine environment and, in particular for the transport sector, CO2 emissions;
- Enhance competitiveness and sustainability of the European biotechnology, and/or materials related industry;

²⁹ Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

³⁰ The contribution of the NMP Theme to this topic is EUR 5 million

- Better understanding/assessment the scope of existing antifouling materials and technologies;
- Contribute to the implementation of EU policies, Environment policy (e.g. the Marine Strategy Framework Directive, REACH), Transport policy (Roadmap to a Single European transport Area – Towards a competitive and resource efficient transport system) as well as industrial and innovation policy, such as the EU Strategy for Key Enabling Technologies and the Lead Market Initiative on Bio-based products.

OCEAN 2013.4 Innovative transport and deployment systems for the offshore wind energy sector

Technical content/scope: In its Communication "Offshore Wind Energy: Action needed to deliver on the Energy Policy Objectives for 2020 and beyond", the Commission underlines that the exploitable potential of offshore wind by 2020 is likely to be 30-40 GW, and in the 2030 time horizon it could be up to 150 GW.

In 2007, the Energy Wind Association assessed that achieving 40 GW by 2020 will mean that 7,800 turbines of 5 MW need to be built over the next 13 years. Those turbines have to be assembled, transported and installed on sites.

The Strategic Energy Technology Plan (SET-Plan) European Wind Initiative identifies transport and logistic issues as key elements for the deployment and maintenance of offshore wind farms. The TP Wind Strategic Research Agenda also points to research needs both in relation to the cost-effective installation, maintenance, operation and decommissioning of large offshore wind farms as well as to transport, logistics and equipment needs.

In its Communication on Strategic goals and recommendations for the EU's maritime transport policy until 2018, the Commission stresses that maritime transport is an important instrument of the European energy policy. Amongst others offshore servicing vessels are considered as increasingly important aspect for ensuring the well functioning of the energy market.

Research activities under this topic shall address the following aspects:

- Development of innovative and cost-effective deployment strategies for large-scale turbines, including building and testing onshore;
- Elaboration of optimal logistical processes and on-land transport links for large offshore structures
- Design of novel vessel types and equipment for installation, maintenance and decommissioning and validation at reduced scale;
- Development of safety procedures for installation, operation and maintenance activities, regarding both offshore wind structures and the vessels;
- Improved operations and maintenance including the enhanced role of remote condition monitoring and systems with reduced human intervention;
- Development of new business models at European level for large offshore systems based on integrated life-cycle approaches;
- Development of methods and tools to assess the field performance of offshore wind farms servicing vessels and for optimised service activities in terms of lead time and energy usage.

Proposals are expected to include validation activities at reduced but industrially relevant scale using testing models and where possible tests at real scale using existing infrastructure and equipment, adapting those to validate models and management tools. Tests should also address extreme conditions. The proposal should cover both ground based and floating wind parks.

The multi-disciplinary approach of the research undertaken is essential to address the topic. Knowledge exchange with oil/gas and maritime sectors is expected. These aspects will be considered during the evaluation under the criterion *Scientific and/or technological excellence*. The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

In the framework of the SET-Plan European Industrial Initiatives a specific monitoring and knowledge sharing mechanism will be established under the auspices of the Commission and the selected project will be expected to participate.

Funding Scheme: Collaborative Project. Up to one project may be funded.³¹

Additional eligibility criteria: The requested European Union contribution shall not exceed EUR 10 000 000 per proposal.

Expected impact: The project will:

- Contribute to the implementation of the roadmap activity of the European Wind Initiative aiming at supporting offshore take-off in the medium-term;
- Contribute to the development of new niche markets for the European shipbuilding and shipping industries thereby contributing to competitiveness of the sector and to the creation of new jobs.

³¹ The NMP Theme does not contribute to this topic

II.5 Recovery Package: Public-Private Partnership (PPP) topics within NMP

The European Economic Recovery Plan adopted by the European Commission on 26 November 2008 and endorsed by the European Council on 11-12 December 2008 proposes actions to develop technologies for the manufacturing, construction and automotive sectors, which have recently seen demand plummet as a result of the crisis and which face significant challenges in the transition to the green economy. The Commission proposed to increase research financing through the RSFF instrument and to launch three Public-Private Partnerships (PPPs) which provide the required support to the three sectors:

- in the manufacturing sector: a 'Factories of the Future' initiative to help EU manufacturers across sectors, in particular SMEs, to adapt to global competitive pressures by increasing the technological base of EU manufacturing through the development and integration of the enabling technologies of the future, such as engineering technologies for adaptable machines and industrial processes, ICT, and advanced materials (EUR 1.2 billion);
- in the construction sector: an 'Energy-efficient Buildings' initiative to promote green technologies and the development of energy-efficient systems and materials in new and renovated buildings with a view to reducing radically their energy consumption and CO₂ emissions (EUR 1 billion);
- in the automotive sector: a 'Green Cars' initiative, involving research on a broad range of technologies and smart energy infrastructures essential to achieve a breakthrough in the use of renewable and non-polluting energy sources, safety and traffic fluidity (EUR 1 billion).

These initiatives are part of a comprehensive, integrated package to be implemented in cooperation between all the responsible services within the Commission, complemented by actions on the demand-side, such as public procurement, technical standards, and regulatory measures. This includes a further EUR 4 billion for non-research activities under the Green Cars Initiative.

The three PPPs are intended to prevent the crisis from deflecting attention from the EU's longer-term interests and the need to invest in its future. Research and Innovation are considered as strategic and 'smart' investments to prepare the ground for the future of the EU economy which has to become a knowledge-based and low carbon economy, as stated in the Europe 2020 strategy. This is crucial for the EU to come out from the crisis stronger, more sustainable and more competitive.

The Commission, working in close collaboration with industrial representatives, has developed multi-annual roadmaps and longer-term research strategies for the three sectors. The initiatives will continue to be implemented, through a series of Cross-thematic Calls and through dedicated topics, under the 2013 work programmes of the relevant FP7 Themes. Responsibility for these Cross-thematic Calls and dedicated topics is as follows:

- The 'Factories of the Future' initiative involves financial support from the NMP³² and ICT³³ Themes;

³² Nanosciences, Nanotechnologies, Materials and New Production Technologies

³³ Information and Communication Technologies

- The 'Energy-efficient Buildings' initiative involves financial support from the NMP and Environment Themes;
- The 'Green Cars' initiative involves financial support from the ICT and NMP Themes (in two separate calls), as well as the Energy and Transport Themes (topics being part of broader calls in their respective work programmes).

In addressing the industrial needs and objectives of each PPP, the Themes will work closely together to ensure a coherent, complementary and holistic approach. To ensure high visibility and to promote cooperation and exchange of information between the research projects funded under the different Themes, it is intended to gather the researchers and the industrial stakeholders together in annual cross-thematic workshops and seminars for each PPP. This would be part of the implementation of the projects.

II.5.1 'Factories of the Future' Public-Private Partnership (FoF) - Cross-thematic Coordination between NMP and ICT

Manufacturing is still the driving force of the European economy. Manufacturing activity in Europe represents approximately **21% of the EU GDP** and provides about **20% of all jobs** (more than 30 million) in **25 different industrial sectors**, largely dominated by **SMEs**. With each job on the factory floor generating approximately two other jobs in services, about 60 million people are additionally engaged in the related service areas. Therefore, manufacturing is of high importance to Europe, with a huge potential to generate wealth, jobs and a better quality of life. The long-term shift from a cost-based competitive advantage to one based on high added value requires that European manufacturing increases its technological base, building on the EU's excellent R&D in this domain, and develops a number of **enabling trans-sectoral production technologies**.

The *Factories of the Future* PPP Initiative aims at helping EU manufacturing enterprises, in particular SMEs, to adapt to global competitive pressures by developing the necessary enabling technologies to support EU manufacturing across a broad range of sectors. It will help European industry to meet the increasing global consumer demand for greener, more customised and higher quality products through the necessary transition to a demand-driven industry with lower waste generation and energy consumption.

The activities will concentrate on increasing the technological base of EU manufacturing through the development and integration of the enabling technologies of the future, such as engineering technologies for adaptable machines and industrial processes, ICT for manufacturing, and the novel industrial handling of advanced materials. The initiative will concentrate on industry-led R&D projects and will include demonstration activities, such as large-scale production-line demonstrators for validation and market applications. The partnership will work together to identify the R&D needs of manufacturing industry and in particular SMEs. In order to further ensure the PPP character of the initiative, a large part of the activities in the projects is expected to be performed by industrial organisations themselves. This initiative, being by nature **cross-sectoral** and including efforts to address the **needs of SMEs**, aims to transform Europe into a dynamic and competitive knowledge-based economy by delivering:

- A new European model of production systems for the factories of the future (e.g. transformable factories, networked factories, learning factories) depending on different drivers such as high performance, high customisation, environmental friendliness, high efficiency of resources, human potential and knowledge creation.
- ICT-based production systems and high quality manufacturing technologies capable of optimising their performance with a high degree of autonomy and adaptability for a balanced combination of high throughput and high accuracy production.
- Sustainable manufacturing tools, methodologies and processes that have the capability of cost-efficiently shaping, handling and assembling products composed of complex and novel materials.

The indicative budget for 'Factories of the Future (FoF)' is EUR 230 million in 2013, of which EUR 160 million is from the NMP Theme and EUR 70 million from the ICT Theme.

**II.5.1.1 'Factories of the Future (FoF)' - Public-Private Partnership –
- Topics covered by the NMP Theme**

FoF.NMP.2013-1 Improved use of renewable resources at factory level

Technical content/scope: A more efficient use, at factory level, of material and energy resources, while at the same time ensuring high productivity rates, has become a key issue for a sustainable manufacturing sector. In this regard, a more extensive integration of technologies related to renewable energy and material resources and an optimal re-use of air, water and scrap (or other waste) along the lifecycle of factories may become a valuable complement to current strategies for resources efficiency. The resources consumed in the production processes, including air and water, should be minimised and the energy efficiency should be optimised in a continuous and iterative manner.

This novel approach would allow European manufacturing companies to take a qualitative leap towards environmentally neutral factories where the production processes and systems will move towards reduced ecological footprints (e.g. near-to-zero carbon approaches), whilst ensuring competitiveness.

This strategy demands new concepts and solutions at factory level, both for existing and new production plants. Research activities should be multi-disciplinary and address all of the following areas:

- Methodologies and tools for eco-efficient design or re-adaptation of production facilities based on co-evolving product-process-production systems including the integration of technologies for energy scavenging and recovery.
- Seamless integration of renewable energy harvesting in production systems for high productivity and maximum energy efficiency in the factories.
- Simulation and optimisation tools for assessing both environmental and economic costs linked with the use of renewable materials and energy resources, as well as technologies for energy recovery with reliable predictive analytics to guide decision-making.

Standardisation, regulation and pre-normative research aspects should be considered. Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

The proposals should cover both research and demonstration activities. Prototypes and pilot implementations in real industrial settings represent a clear added-value. Whilst there is no lower or upper limit on the requested EU contribution, the target is that proposals allocate around 50% of the total eligible costs of the project (excluding management costs) to demonstration activities and this objective will be taken into account in the evaluation under the criteria S/T Excellence and Impact.

Projects are expected to use appropriate Life Cycle Assessment techniques in order to estimate the impact of energy efficiency and improved use of renewable materials and energy resources on the price of final products. Projects are also expected to generate knowledge to

support European policy development and promote standardisation (at national or international level).

Funding scheme: DEMO-targeted collaborative projects.

Expected impact:

- In economic terms, reduction of 20% in the total lifecycle costs of factories with respect to conventional factories of similar productivity rates, due to an increase in energy efficiency and improved use of renewable resources.
- In environmental terms, a major step towards zero-carbon footprint manufacturing systems and processes, with drastic reduction of total lifecycle environmental impacts.
- Strengthened global position of European manufacturing industry through the introduction of the new technologies related to an improved use of renewable resources and contributions to international standardisation.
- Strong support for eco-labelling policies and standardisation.

FoF.NMP.2013-2 Innovative re-use of modular equipment based on integrated factory design

Technical content/scope: Current markets and customer demands impose quick changes in terms of product models, with smaller lot sizes and increased variety. Moreover, with increased customisation, multiple similar products are produced in small lots in a shared production line as a result of just-in-time production. Therefore, for the economic sustainability of the production systems, an innovative re-use of modular equipment based on integrated factory design methodologies needs to be addressed. This requires a cost-efficient and modular approach for production systems, with a higher standardisation level regarding production equipment and components, allowing a highly flexible and reconfigurable production in the long term.

Research activities should address at least the first two of the following areas:

- Proactive modularisation and re-use strategies for the development of the future machinery and production systems and their integration in old, new or renewed factory facilities.
- Innovative factory lay-out design techniques able to integrate new approaches to leverage all potential synergies between the concurrent design of plant and processes, taking into account best practices for de-manufacturing, dismantling, recycling and value-chain extension.
- Flexible, low-cost assembly/disassembly solutions to aim at a high market penetration with those solutions by the machine component suppliers and systems integrators, by developing low weight and mobile solutions (e.g. flexible grippers), as well as systems (e.g. automation, vision and control) for their seamless integration in factories.

Standardisation, regulation and pre-normative research aspects should be considered. Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

The proposals should cover both research and demonstration activities. Prototypes and pilot implementations in real industrial settings represent a clear added-value. Whilst there is no lower or upper limit on the requested EU contribution, the target is that proposals allocate around 50% of the total eligible costs of the project (excluding management costs) to demonstration activities and this objective will be taken into account in the evaluation under the criteria S/T Excellence and Impact.

Projects are expected to use appropriate Life Cycle Assessment techniques and to generate knowledge to support European policy development and promote standardisation (at national or international level).

Funding scheme: DEMO-targeted collaborative projects.

Expected impact:

- Cost reduction of around 30% due to re-use of existing modular equipment when setting-up production systems for new product variants.
- Set-up and ramp-up time reduction of around 30% for new or retrofitted plant designs.
- At the end-of-life stage, a step contribution towards a 100% reuse of production system components in new life cycles.
- Strengthened global position of European manufacturing industry through the introduction of the new technologies related to an innovative re-use of equipment based on integrated factory design and contributions to international standardisation.

FoF.NMP.2013-3 Workplaces of the future: the new people-centred production site

Technical content/scope: The workplaces of the future will give much more importance to the human dimension. Putting people at the centre of future factories will provide a stimulating environment for the employees, and make the most from their knowledge, skills and cultural background, in particular through life-long learning and training. Those new workplaces should effectively be integrated into the social (e.g. urban/rural) environment in order to sustainably respond to the needs of the citizens (e.g. quality of air, level of lighting and noise, traffic congestions, etc.) and, at the same time, provide extended services to the workers in terms of safety, accessibility, inclusiveness, efficiency and work satisfaction.

This approach would lead European manufacturing industry to make a qualitative leap towards new people-centred and knowledge-based production workplaces which take into account the constraints of the work force, for example those of aged workers. The workplaces of the future should, therefore, be based on methodologies for enhancing flexible, safe and smart production where adequate levels of automation are applied, while maintaining a level of employment with highly satisfied and skilled workers and, at the same time, ensuring competitiveness.

This strategy demands new concepts and solutions at factory level, both for existing and new production plants. Research activities should be multi-disciplinary and address several of the following areas:

- New approaches to integrate the European factories of the future in their social (urban/rural) environment including urban transport, parking, shopping and entertainment centres, support to families, etc.
- New methods and technologies for an optimised use of workers' knowledge and cognitive capabilities (e.g. for data acquisition, transmission, handling and post-

processing), for the stimulation of team interactions and to enhance work related satisfaction, in order to achieve a more human centred and safe workspace, e.g. through the use of knowledge management and decision making systems which are better designed to access, capture and share know-how.

- New methods and technologies for enhanced cooperation of the human operators and the production systems (e.g. Human Factors Engineering), in a safe, flexible and dynamic way, to carry out tasks interactively. New models for human/system integration taking into account the skills, capabilities, and knowledge of the human operator early in the production system design process. New methods and technologies for efficient human/human interaction and team collaboration, to enhance joint decision-making and team-based efficiency.
- New approaches related to safety and ergonomics of the working areas by the optimisation and personalisation of working environment parameters (e.g. indoor/outdoor lighting, temperature, and humidity) and the integration of advanced safety systems, taking into account worker's age, experience and physical condition, and workers interactions.
- Methodologies and tools for people-centred production to guarantee an efficient transition from current to future worker task/role definitions and multi-skilled involvement of individual workers with expanded responsibility in broader sets of operations (e.g. maintenance, logistics, and quality control).

Screening of existing national/international standards (e.g. safety regulations) and of the needs for new standards is required. Other standardisation, regulation and pre-normative research aspects should also be considered.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

This topic is particularly suitable for collaboration at international level, particularly under the IMS scheme³⁴. Project partnerships that include independent organisations from at least three IMS regions³⁵ are therefore encouraged.

Funding scheme: Small or medium-sized collaborative projects.

Expected impact:

- In economic terms, an increase of above 20% in the productivity rate due to an enhanced use of human resources, reduction of costs related to accidents and occupational diseases, reduction of absenteeism in the workplace and by increasing the pool of potential workers through widening the skill profile.
- In environmental terms, a more friendly integration of the factory in the social environment, with drastic reduction of total environmental impacts.
- In social terms, a reduction in the number and severity of work accidents and diseases, an improvement in the working conditions in factories and in the attractiveness of the

³⁴ IMS (Intelligent Manufacturing Systems) is an industry-led, global, collaborative research and development programme, started in 1995 as the world's only multilateral collaborative R&D framework: www.ims.org

³⁵ The current member regions of IMS are the European Union, the United States of America, Korea, Mexico and the EFTA states of Norway and Switzerland.

working environments for the right-skilled people due to knowledge-based ergonomic approaches to manufacturing.

FoF.NMP.2013-4 Innovative methodologies addressing social sustainability in manufacturing

Technical content/scope: In order to ensure the social well-being of people in the factories of the future, there is a need to redefine the human role in manufacturing.

New forms of interaction between process, machinery and human beings need to be addressed in such a way that future factories can be operated profitably, and at the same time provide a stimulating environment for the employees, and make the most from their skills and knowledge through life-long learning. On the basis of these new interactions, manufacturing jobs need to be re-defined and re-engineered and new roles for people in the factory need to be introduced. Cross-discipline studies are needed in order to explore profitable business approaches where the social element in sustainability can be a key factor to ensure midterm economic success while maintaining a high level of employment, even in a period of crisis.

Those business approaches may require an adaptation of organisational structures and management strategies to take into account social sustainability requirements.

Developments in this area are expected to lead to:

- Work satisfaction of employees within the factories of the future.
- New profitable business approaches benefitting from the relevance given to the importance of social sustainability.
- Sustainable use of human capital (e.g. staff knowledge) in the factories of the future.

Within this context, this Support Action should deliver an assessment of relevant past and current activities in Europe (and worldwide) towards the achievement of social sustainability in manufacturing, a set of recommendations on how social sustainability can be measured and enhanced, a definition of what is necessary to support this in terms of research, i.e. a future research roadmap on relevant S&T themes, a definition of the conditions in a factory and /or in society that are favourable for this purpose, and a relevant pilot case.

Additional eligibility criterion: The requested EU contribution must not exceed EUR 500 000 per project, and the project duration must not exceed 18 months.

Funding scheme: Coordination and Support Actions (Support actions). No more than one support action will be funded.

Expected impact:

- Improved understanding of the current situation and future perspectives for social sustainability in European manufacturing.
- Improved synergy among stakeholders around Europe, and community building for future take-up actions.
- Facilitation of a structured approach to promote social sustainability for the European factories of the future.
- Improved production and consumption strategies in line with the societal challenges foreseen by the Europe 2020 strategy.

FoF.NMP.2013-5 Innovative design of personalised product-services and of their production processes based on collaborative environments

Technical content/scope: New product-services go nowadays beyond the physical and service oriented concept, since they are designed in order to be always connected, self-learning, adapting and intelligent. In order to generate economic growth, manufacturers should focus on delivering *solutions* for customer needs rather than simply *products* (or product-services) for their customers. Therefore, new business opportunities will be generated when providing increased added-value to users by integrating personalised innovative functions into traditional and high-tech products.

This business challenge can be addressed by embedding more and more knowledge in highly-personalised innovative product-services (i.e. the so called Meta Products). These novel products are expected to be self-innovative and become smarter while ensuring simplicity for users. They will be upgradable through software applications or hardware module enhancement, which extend their lifespan, and reduce the environmental impact. In addition, they will provide improved value-added services for a wide range of users, but with personalisation aspects so as to consider individual demands. Meta Products will therefore require the use of new, interoperable, self-organising and collaborative design methodologies and systems. Product development should take place through a collaboration within the product ecosystem, involving multiple companies and actors, in order to offer the high-value personalised product-services to users.

On the other side, new product design and development is fully linked to the concurrent design of the related manufacturing processes, equipment and facilities, including plant layout. This need has a strong influence on several aspects related to the life-cycle of both the product and its manufacturing processes (e.g. costs, production, disposal, environmental footprint). Meta Products will be capable of providing advanced service solutions along the whole customer value chain (from the product acquisition to the product dismissal), integrating personalised design, sustainable production, efficient distribution, after sale services, as well as foreseen recycling and re-manufacturing. Cost-effective design solutions with high potential in terms of eco-design content (i.e. minimal footprint impact along the product life-cycle) leading into a new technological cycle (i.e. cradle to cradle concept), should aim at the simultaneous life-cycle optimisation of product-services and related processes.

Research activities should focus on several of the following areas:

- Methodologies and systems for cross-sectoral collaborative design (e.g. 3D drawings, simulation models) enabling the seamless connection and use by all the stakeholders (e.g. product designers, service providers, users) involved in the Meta Product life cycle.
- Collaborative design tools to support the development of Meta Products based on Service Oriented Architecture (SOA). They should be able to connect the design of the product hardware with the development of the software related to the embedded services, based on open source software applications.
- Novel approaches for embedding knowledge into product-services (e.g. use of smart materials, tracking systems, sensing and interacting technologies) in order to add more personalised innovative functions into traditional and high-tech products.
- Embedded tools for product adaptability to enable Meta Products to store usage behaviour and utilise the data to re-organise the embedded services. Feedback mechanisms should be integrated within the tools and should provide the data to the

networked companies involved in the design, manufacturing and service-related operation of the Meta Products.

- User-oriented simulation systems (e.g. virtual reality, reverse engineering) for product-service modelling and production-related decision-making approaches (e.g. requirements identification by means of the demand market and user-perceived quality analysis), covering the needs all along the life-cycle.

Standardisation, regulation and pre-normative research aspects should be considered. Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

Projects are expected to use appropriate Life Cycle Assessment techniques and generate knowledge to support European policy development and promote the standardisation (at national or international level).

Funding Scheme: Large-scale integrated collaborative projects.

Expected impact:

- Increased ability to rapidly follow the market dynamics by means of fast production and delivery of personalised final products
- Cost reduction of around 30% by decreasing lead times in product/process development.
- Set-up and ramp-up time reduction for new processes and plant designs (30%).
- Reduction of around 40% in the environmental footprint and the resources consumption during the production and use phases of the Meta Products, together with an increased use of more environment-friendly materials.

FoF.NMP.2013-6 Mini-factories for customised products using local flexible production

Technical content/scope: Product customisation on functional and aesthetic aspects is a common trend to different market segments (e.g. fashion and interior furnishing, sport and leisure, metal working, bio-medical and safety-related products). Advanced production equipment and innovative systems are needed to enable ultra-fast and cost-effective manufacturing of fully customised products on the spot and exactly at the required time. Innovative production solutions should be developed to bring manufacturing operations closer in time and space to the final customer, eventually exploring the possibilities of moving from batch to continuous flow manufacturing. In addition, new factory concepts need to be developed, such as on-site factories or factories-in-a-container, which provide instant manufacturing and customisation services locally, for example in retail environments or utilisation sites.

Those mini-factories, addressing adaptation to customer needs at or near the point of sales or use, will be characterised by fast ramp-up, small environmental footprint and reusability, and

will be easy to handle and to set-up. Those production systems should also include new technologies for supply chain management, product distribution and direct end-user interaction.

Research activities should focus on some of the following areas:

- Scale reduction and increased flexibility of production systems in order to satisfy the special requirements of the local flexible mini-production units, which have to show a competitive advantage compared to the traditional larger factories in terms of space, complexity and operator skills.
- Adaptive control and auto-configurable automation systems for local flexible production with high customisation capabilities, where manufacturing operations and sequences need to accommodate to the highly unpredictable customer demands.
- New and integrated product/process engineering solutions, including CAD-CAM systems, able to automatically adapt product features to specific customer demands and accordingly configure processes and machines for local production.

Standardisation, regulation and pre-normative research aspects should be considered. Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

The proposals should cover both research and demonstration activities. Prototypes and pilot implementations in real industrial settings represent a clear added-value. Whilst there is no lower or upper limit on the requested EU contribution, the target is that proposals allocate around 50% of the total eligible costs of the project (excluding management costs) to demonstration activities and this objective will be taken into account in the evaluation under the criteria S/T Excellence and Impact.

Funding scheme: DEMO-targeted collaborative projects.

Expected impact:

- Increased ability to rapidly follow the market dynamics by means of fast production and delivery of customised final products.
- Reduction of the time to market by 50%.
- Cost reduction (around 30%) by decreasing lead times in product and process development.
- Reduced environmental impact per produced unit compared to traditional larger factories.
- Set-up and ramp-up time reduction (around 30%) for new processes and plant designs of the mini-factories.

FoF.NMP.2013-7 New hybrid production systems in advanced factory environments based on new human-robot interactive cooperation

Technical content/scope: The future factory environments for manufacturing, and in particular assembly/disassembly operations and auxiliary processing such as lifting and

moving of heavy goods, will radically improve by integrating new forms of interaction between process, machinery and workers in such a way that future factories can be operated profitably and make the most from employees' knowledge and skills. Hybrid production systems, where robots physically interact with humans, need to ensure an intuitive and safe cooperation among them and an enhanced awareness of the work conditions and the constraints imposed by the factory environment.

A new generation of production systems (e.g. machinery as well as industrial and service robots) will maintain the competitive advantage of the European manufacturing sectors. Future machinery and robots will be based on intelligent features, increasing flexibility in a totally safe environment, enhancing the use of this advanced equipment in a cooperative way with their human operators (machine/robot-human and machine/robot-robot interactions), as well as on self-learning functionalities that allow them to be aware of the current and future tasks.

Research activities should focus on at least three of the following areas:

- Technologies for a reliable and safe machine/robot-human and machine/robot-robot interactive cooperation in applications where the equipment will carry out the tasks which provide power, repeatability and extended work-space while the human operators will provide accuracy, flexibility and problem solving capacity.
- Methodologies for the improved planning of the shared tasks, based on analysis and simulation of real-time collaboration at the production site and by the user-friendly programming of complex tasks, using information from factory sensor networks, and taking into account the constraints from factory environments in predefined automatic or semi-automatic assembly/disassembly operations, e.g. using advanced real-time augmented reality in complex operations.
- Novel methods of programming for fast-teaching and guided-learning in order to adapt robot work tasks dynamically during operation to the changeable production requirements (e.g. in hybrid assembly of serial products such as automotive, white goods, airplanes, where frequent changes of production require regular updates of the assembly tasks as well as adjustment of workplaces, fixtures and tools).
- Technologies on mobile robots for improved intra-factory logistics, based on enhanced safe navigation in non-structured environments. Dynamic planning methodologies, coordination control and path reconfiguration strategies, taking into account wireless communication, in a safe interaction with operators have to be addressed.

The human-robot safety features, enabling production operation in workspaces shared with humans without separating safety fences or in direct human-robot operations, should lead to advances in the certification of the related production systems working in industrial environments and in the characterisation of risks and safety systems.

Screening of existing national/international standards (e.g. safety regulations) and of the needs for new standards is required. Other standardisation, regulation and pre-normative research aspects should also be considered.

Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

Funding Scheme: Large-scale integrated collaborative projects.

Expected impact:

- Increasing use of robot installations in manufacturing. Today, only some 15% of robot automation potential is being exploited. Further improvement in robot exploitation will contribute to higher employment as more manufacturing capacity will remain in Europe.
- Increasing adaptability of advanced factories by combining the flexibility inherent to humans with the enhanced potential of cooperative production systems, maintaining reduced investment costs and allowing a wide use of those systems in new production areas and sectors, particularly SMEs.
- Promotion of equal opportunities on the shop-floor in terms of gender, age and skills, due to less physically demanding jobs in manufacturing and improved working environment and including accessibility for programming and use.

FoF.NMP.2013-8 Innovative strategies for renovation and repair in manufacturing systems

Technical content/scope: Extending the life and performance of manufacturing equipment as well as designing for re-use/upgrade or ease of renovation (including functional/technological upgrade) and repair requires innovative methodologies which may include Life Cycle Assessment (LCA) and smart devices based on ICT or advanced materials. Design and manufacturing of plants and equipment which integrates renovation, refit and repair strategies (including upgrade for the enhancement or lifetime extension of equipment) as well as increased ability to track equipment use should be simultaneously addressed to optimise the life cycle of production systems.

Research activities should focus on several of the following areas:

- Renovation and repair approaches for manufacturing plants and equipment including the design phase and life-cycle evaluation.
- Use of existing smart devices and systems based on ICT or advanced materials in the renovation and upgrade of existing structures.
- Repair, upgrade, re-manufacturing and re-assembly processes (including replacing modules by less energy-consuming ones) in the in-situ renovation of infrastructures.
- Systems providing (self) monitoring and diagnostic tools to manage plant and equipment usage and addressing maintenance/renovation/repair or substitution needs.
- Mathematical methods and algorithms for failure mode detection and component degradation assessment.
- New engineering methodologies and supporting tools for machinery recovery and re-use approaches for substituted components.

Standardisation, regulation and pre-normative research aspects should be considered. Proof of concept in terms of at least one demonstrator should be delivered before the end of the project,

excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

Projects are expected to use appropriate Life Cycle Assessment techniques and to generate knowledge to support European policy development and promote the standardisation (at national or international level).

Funding Scheme: Large-scale integrated collaborative projects.

Expected impact:

- In terms of economic sustainability, reduction of around 20% of renovation and repair costs, through a better condition-based monitoring and condition-based substitution and repair.
- In terms of environmental sustainability, recovery of at least 80% of the substituted materials for its re-use.
- In terms of social sustainability, eventual elimination of hazardous materials and renovation of outdated plants and structures.

FoF.NMP.2013-9 Advanced concepts for technology-based business approaches addressing product-services and their manufacturing in globalised markets

Technical content/scope: In order to remain on the leading edge and to extend their shares in future global markets, European companies need to offer new user-oriented higher value-added solutions, with appropriate global service infrastructures. Moreover, the decreasing lifecycle times of products and the increasing number of variants require the design and operation of assembly plants and production networks that are fully flexible, i.e. capable of switching production from one model to another to meet the fluctuating and diverse demand.

Therefore, advanced holistic concepts for technology-based business approaches are needed, in order to help European global enterprises to dynamically operate at multiple locations around the world in a volatile economic environment, taking into account local resources such as commodities, energy, labour, etc. Such global business approaches should include emerging technologies and innovative manufacturing systems and methods, in order to enable European companies to offer their customers a broader variety of affordable products and an extended range of services.

These innovative concepts should provide a fast and efficient response to market variations and should be easily adaptable to the requirements of other industrial sectors. They should support the transition of a European manufacturing enterprise from a traditional product-based approach to a global-minded approach, in which a complex network of actors (mainly SMEs) is able to provide a customised product-service solution to each final customer in the global market. Such a global approach should define standardised formats and interfaces, models and procedures for planning and running fast, integrated, flexible and scalable manufacturing related activities for product-services, using a global supply chain.

Research activities should focus on all of the following areas:

- Technological concepts to address economic and risk assessment in order to support decision-making in the early design of the manufacturing systems, in particular for the integration of new complex technologies in the factory.
- Interactive, model-based decision-making processes for business management, able to assess the impact on performance of alternative configurations of the network of actors involved in the global supply chain for product-services and related production systems.
- Methodologies and tools to manage the co-evolution of products-services and the related production systems in the framework of innovative business approaches.

Screening of existing national/international standards (e.g. safety regulations) and of the needs for new standards is required. Other standardisation, regulation and pre-normative research aspects should also be considered.

Projects are expected to use appropriate Life Cycle Assessment techniques and to generate knowledge to support European policy development and promote the standardisation (at national or international level).

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

This topic is particularly suitable for collaboration at international level, particularly under the IMS scheme.³⁶ Project partnerships that include independent organisations from at least three IMS regions³⁷ are therefore encouraged.

Funding scheme: Small or medium-sized collaborative projects

Expected impact:

- Cost savings of around 30% in production due to improved scheduling and to more robust manufacturing methods.
- Higher reactivity to customer needs around 40% as result of real time adaptable business approaches which include proper legislation monitoring.
- Increased robustness of the supply network around 30%.
- Product-services and their manufacturing processes which are more environment-friendly at global scale.

FoF.NMP.2013-10 Manufacturing processes for products made of composites or engineered metallic materials

Technical content/scope: Products made of composites or engineered metallic materials are becoming more popular in many industrial sectors due to the increased capabilities of design techniques which are able to simulate material properties with a high level of accuracy and, therefore, to optimise the exploitation of their improved properties. Increasingly challenging

³⁶ IMS (Intelligent Manufacturing Systems) is an industry-led, global, collaborative research and development programme, started in 1995 as the world's only multilateral collaborative R&D framework: www.ims.org

³⁷ The current member regions of IMS are the European Union, the United States of America, Korea, Mexico and the EFTA states of Norway and Switzerland.

demands continue arising from market and society in terms of better functional properties, weight reduction, cost decrease, compact design, and minimal carbon foot-print. Composites and engineered metallic materials are now used in many products, either as standalone components or embedded reinforcements in order to locally provide their specific performance in terms of enhanced mechanical properties. An extensive use of such materials leads to significant product improvements that cannot be achieved with the traditional metals or polymers.

However, the processes for manufacturing such products require a better understanding and further optimisation in order to ensure the required quality for the specific applications and a high productivity rate for cost-efficient manufacturing. Production technologies for composites and engineered metallic materials include casting, forming, removal and additive processes related to 3D metals, sandwich materials, multi-materials, new metallic alloys, thermoplastics or composite laminates.

Research activities should focus on several of the following areas:

- Innovative methodologies and technologies for manufacturing which are capable of producing and post-processing new engineered metals and composites taking into account the needs for specific applications.
- Systems and devices to monitor and optimise the process parameters for these new materials to be produced and post-processed at industrial scale.
- New technologies for joining and assembly of multi-materials components (e.g. metal/composite, polymer/composite, and engineered metallic/composite) based on enhanced understanding of the material-interface behaviour at micro/nano scale.
- Characterisation and testing techniques to evaluate the performance (e.g. quality, throughput rate, robustness) of the manufacturing processes for products made of new materials.
- Development of product repair technologies and methodologies to assess the repair feasibility of the manufactured product and to ensure repeatable, safe and certified repair procedures.
- Recycling technologies and routes that guarantee a minimal environmental foot-print of the products made of the new materials at the end of their life.

Screening of existing national/international standards (e.g. safety regulations) and of the needs for new standards is required. Other standardisation, regulation and pre-normative research aspects should also be considered.

Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

Funding scheme: Small or medium-sized collaborative projects.

Expected impact:

- Higher utilisation of advanced materials in products with improved performance without a cost increase.
- Decrease in raw materials and energy consumption by at least 20% during the processing, manufacturing and/or dismantling phases.
- Reduction of waste and emissions (e.g. fumes, chemicals, dust, hazardous materials) by at least 30% during the processing, manufacturing and/or dismantling phases.

FoF.NMP.2013-11 Manufacturing of highly miniaturised components

Technical content/scope: Product miniaturisation requires a good understanding of the intended application, the scale-related property variation, the manufacturing methods and the material behaviour. Miniaturisation has been an increasing trend in the last 15 years because of the drive for minimisation of energy and materials use in manufacturing processes, the increased need for redundancy, the requirements of faster and more energy-efficient devices, and the enhanced functionalities (such as selectivity and sensitivity).

Micro-fabrication techniques are widely exploited by the semiconductor industry, which has invented many micro- and nano-scale manufacturing methods. These methods could be regarded, in general, as potential techniques for the miniaturisation of components in many other industry sectors. However, they are mostly addressing a particular class of materials and 2D surfaces with specific features, and are highly sophisticated and expensive (high cost of ownership).

Alternative manufacturing technologies are currently needed to overcome the challenges of volume production of miniaturised components or sub-components made of a wide range of materials (e.g. metallic alloys, composites, ceramic and polymers). These techniques should be cost-efficient and flexible in terms of both the shapes of the features and the materials being used. In order to reach this objective in a competitive way, the upgrading of appropriate high-throughput and cost-efficient processes like conventional forming, moulding, imprinting and surface deposition processes, or new integrated process chains, will be needed. New materials pose new challenges for cost-efficient manufacturing in order to shape, handle and assemble complex structures that can involve macro-micro-nano scale features and may require the analysis of the micro-structural behaviour of materials and its interaction with the production process.

Research activities should focus on at least three of the following areas:

- Processing techniques for miniaturised components made of a wide range of materials with different properties (e.g. thermo-responsive, piezoelectric, or phase-change materials), in order to achieve a flexible and high-throughput production.
- Integration of multiple material combinations and smart materials for the sensing and actuation technologies.
- Merging the top-down and bottom-up approach in order to go into parallel and/or continuous manufacturing.
- Novel on-line monitoring and quality inspection systems in manufacturing of highly miniaturised components, in order to ensure efficiency, reliability and high product quality.

Projects are expected to address issues like energy savings, cost and waste reduction, and recycling that should be studied through Life-Cycle Assessment.

Projects should show substantial improvements in the manufacturing of components at the micro and nano-scale in terms of cost/performance balance (e.g. lower costs per integrated function), accuracy and reproducibility by providing the appropriate cost-efficient and reliable manufacturing technology.

Screening of existing national/international standards (e.g. safety regulations) and of the needs for new standards is required. Other standardisation, regulation and pre-normative research aspects should also be considered.

Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure an efficient implementation and maximum impact of SME-related activities, the leading role of SMEs with R&D capacities will be evaluated under the criteria Implementation and Impact: the coordinator does not need to be an SME but the participating SMEs should have the decision making power in the project management; and the output should be for the benefit of the participating SMEs and the targeted SME dominated industrial communities.

Funding Scheme: SME-targeted collaborative projects.

Expected impact:

- Improved high-throughput and/or highly flexible and cost-efficient processes for micro/nano-manufacturing of components for application areas such as tools, electrodes, solar cells, consumer products, and communication and medical devices.
- Scaling up of micro-production processes from lab-scale to an industrial scale for multifunctional applications such as in medicine, energy, transport and electronics.
- Further progress on micro/nano-manufacturing towards intelligent, scalable and adaptable systems, enabling the cost-efficient, competitive and market-demand-targeted production, ranging from small/medium volumes to high throughput and thus facilitating the access to target markets characterised by small or growing volumes.

II.5.2 'Energy-efficient Buildings (EeB)' – Public-Private Partnership –

Cross-thematic Coordination between NMP and Environment (including Climate Change)

The construction industry accounts for more than 10% of the EU's GDP and employs 32 million people in large, medium and small enterprises (direct and indirect employment). The creation and operation of built environment is the highest contributor to the emission of Green House Gases with an average value estimated in most developed countries at close to 33%, knowing that around 40% of the total energy use corresponds to buildings, while their fossil-fuel heating represents a major share. Therefore, in the near future, the built environment in Europe needs to be designed, built, operated and renovated with much higher energy efficiency. In order to achieve the objectives of the Energy Policy for Europe adopted early in 2007 and to contribute through Energy-efficient Buildings to the 20% reduction of energy consumption, 20% use of Renewable Energy Sources and 20% reduction of CO₂ emissions, a strong and continued effort in RTD and innovation in the short, medium and long term is needed.

The objective of the *Energy-efficient Buildings PPP Initiative* is to deliver, implement and optimise building and district concepts that have the technical, economic and societal potential to drastically reduce energy consumption and decrease CO₂ emissions, both in relation to new buildings and to the renovation of existing buildings. This new initiative should have a large payoff, as it will increase the market for energy-efficient, clean and affordable buildings. Research priority will be given to delivering new building materials and components for energy saving and energy generation, thermal energy storage systems, advanced insulation systems, thermal distribution systems, lighting technologies, windows and glazing technologies, energy generation systems based on renewable sources, but also to reliable simulation and prediction tools, including assessment methods that integrate economical, social and environmental issues, including comfort and safety. To date, the construction industry has failed to effectively integrate key technologies into its operations in order to achieve sustainable, long-term competitiveness.

The aim of the activities is to identify, through the partnership with industry, the main RTD needs, and address a number of areas of clear industrial interest, such as tools, the building envelopes, systems and equipment, ICTs for energy efficiency, environmental technologies, social and behavioural aspects, standardisation and business models. Specific deliverables expected for new and refurbished buildings (including cultural heritage) are:

- Research for new design and manufacturing technologies, focusing on materials and components, thermal energy storage systems, advanced insulation systems, thermal distribution systems, lighting technologies, windows and glazing technologies, and assessment methods and tools which include guidelines/methodologies for the eco-design and the Life Cycle Assessment of energy-efficient buildings.
- Research on ICT for energy efficiency in buildings, such as design and simulation tools, inter-operability/standards, building management systems, smart metering and user-awareness tools.

- Research for systemic, optimised and validated coherent set of solutions for all categories of existing buildings and climate in Europe.
- Research on resource efficiency (waste and energy use) to identify best practices to help set standards and establish public policies for higher energy efficiency and reduced environmental impact.
- Research on the application of technological, design and organisational improvements at district-level with the aim of reducing the energy and resource consumption.
- Research-related activities on key demonstration topics concerning integration of innovative products and systems, grid issues and business models.

The indicative budget for 'Energy-efficient Buildings (EeB)' is EUR 116 million in 2013, of which EUR 110 million is from the NMP Theme and EUR 6 million from the Environment Theme.

The topics of the EeB initiative also support the Smart Cities Scheme, whose main call is FP7-SMARTCITIES-2013.³⁸

In addition, the topics FP7.ENERGY.2013.8.8.1 and FP7-ICT-2013.6.4 under the coordinated call on Smart Cities and Communities between the Energy and ICT Themes will contribute to the objectives of the EeB Public-Private Partnership Initiative. The indicative budget for the Smart Cities call contributing to the EeB objectives is EUR 209 million, of which EUR 114 million is from the Energy Theme, and EUR 95 million from the ICT Theme.

II.5.2.1 'Energy-efficient Buildings (EeB)' - Topics covered by the NMP Theme:

EeB.NMP.2013-1 Nanotechnology for multifunctional lightweight construction materials and components

Technical content/scope: Nanotechnologies represent a promising opportunity for the energy-efficient transformation of the current building stock and the energy efficiency of new buildings. Although main efforts are given to the reduction of thermal transmittance of the envelope, there are other key functionalities which are becoming more and more relevant in retrofitting and new buildings.

With state-of-the-art products and combinations of materials, the envelope thickness during energy-efficient renovations is increasing and it gets more massive both in terms of architectural design and in terms of actual physical mass. Nanotechnology has the potential to enable multi-functionality in envelope components, fostering the development of systems which can combine functionalities like being light-weight, high thermal capacity in a defined temperature range, fire resistance in particular for steel structures, sound insulation as well as others such as Volatile Organic Compounds (VOCs) abatement, bio-protection, self-cleaning or humidity control, paving the way for industrial prefabricated new-to-build and deep-

³⁸ see Theme 3 (ICT) and Theme 5 (Energy)

renovation packages, which can outperform on-site construction on issues as thermal-bridges and air tightness while ensuring high quality for the indoor environment. These new technologies will ultimately diminish the time required for the renovation itself while reducing the energy bill during the entire building service life. They will also address emerging health issues related with materials and ventilation such as allergies or pathologies like the sick building syndrome. On top of increased technical performance, nanotechnology enabled multifunctional light-weight solutions should increase affordability and overall return on investments.

Nanotechnology research should focus on development of new light-weight multifunctional components with high potential for energy savings, in particular for façades or roofing and for better indoor environment quality, while complying with building codes and regulations. Furthermore, potential exists to exploit nanotechnology through the development of nano-electromechanical systems (NEMS) embedded in the components and which could see whole buildings become networked with detectors and sensors to monitor energy efficiency and the quality of the indoor environment. As a result, new improved multi-functional lightweight high insulation, high reflectivity elements with low heat transfer in relation to thickness and improved mechanical properties are foreseen, providing clear benefits for the occupants in terms of high quality of the indoor environment. The new materials and their combination into components should also consider durability, easy installation, integration and aesthetics, increased indoor comfort, embodied energy, resource-efficiency, economic, health and safety aspects, environmental aspects, disassembly and reuse, etc. For safety related aspects, projects are expected to coordinate and collaborate with other relevant projects of the Nanosafety Cluster³⁹.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners will represent an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding Scheme: Small or medium-scale focused research projects.

Expected impact: Lightweight building components are expected for low-cost, low-energy new buildings or quick low-cost refurbishments, aiming at a factor of 2 to 4 in total (primary) energy reduction with respect to the current situation, and a cost-level equal to or better than traditional (in terms of energy performance improvement) renovation activities⁴⁰.

Nanotechnology solutions will contribute to develop new components with key advantages in terms of thermal performance and reduced construction time due to 40% decrease of the dead load of the building components compared to existing solutions. It is expected that the elements will achieve at least the same fire resistance as conventional material consuming solutions while reducing the mass of the components and energy consumption⁴¹.

EeB.NMP.2013-2 Safe, energy-efficient and affordable new eco-innovative materials for building envelopes and/or partitions to provide a healthier indoor environment

³⁹ <http://www.nanosafetycluster.eu/>

⁴⁰ Nanotechnology-based lightweight solutions should be demonstrated at industrial component level in relevant environments. The innovative elements should be low-cost (LCCA) and environmental friendly (LCA), with high thermal resistance and high fire resistance in relation to thickness. The sustainability of each developed solution should be evaluated via life cycle assessment studies carried out according to the International Reference Life Cycle Data System - ILCD Handbook.

⁴¹ Safety, fire resistance, mechanical and other features should be properly addressed, in line with building codes and regulations.

Technical content/scope: A healthier indoor environment during the service life of a building is becoming more and more critical because the implementation of energy efficiency measures leads to the construction of more tightly sealed buildings with reduced ventilation rates. Furthermore, increasingly synthetic building materials and furnishings, or natural products formulated with chemicals, biocides etc., are used.

Improved construction techniques, caulking and sealing limit the amount of air which escapes. Consequently pollutants can build up to unhealthy levels inside the buildings.

Several factors affect a healthy indoor environment. Among the most important are: release of dangerous substances, Volatile Organic Compounds (VOCs) such as formaldehyde, wood preservatives, radon, fibres, particulate matters, moisture and humidity, rotting and microbiological/mould growth, etc.

Building envelopes play an important role in controlling the amount of moisture which enters in the building or leaves it. Noise protection and comfort with regard to temperature and humidity distributions are also important factors that may be valorised to contribute to a healthy indoor environment. Comfort influences health also in the long term.

Research proposals should address the development of new eco-innovative materials for the building envelope and/or internal walls/partitions leading to healthier indoor environment. Issues on indoor environment related to the building content (interior decoration, carpets, paints and lacquers, furniture, electronic equipment, cleaning supplies etc.) or use (e.g. cleaning agents) are *not covered by this topic*. Technological solutions, such as improved ventilation and air filtration, are likewise *not covered by this topic*.

The proposed solutions should go well beyond the state of the art and primarily improve the indoor environment. The cost-effective use of nanotechnologies can contribute to solve humidity, odour and pollutant problems.

The following factors should also be considered: low embodied energy and enhanced durability for increased use duration, reduced maintenance and consequently reduced costs, respect of sustainability principles (the sustainability of each developed solution should be evaluated via life cycle assessment studies carried out according to the International Reference Life Cycle Data System - ILCD Handbook); application to both new build and renovation when relevant; ease of installation; offer of realistic solutions at a reasonable price; offer of increased comfort and noise reduction. Recycling/reuse of materials may also be addressed. Standardisation aspects can be considered particularly in relation with the work carried out in CEN/TC 350 and CEN/TC 351. Proof of concept in terms of one (or more) component(s) containing the new eco-innovative materials developed should be delivered within the project, excluding commercially usable prototypes (2006/C323/01), but convincingly proving scalability towards industrial needs. Information guides for applications, installation and training on the new solutions should be provided before the end of the project.

All aspects should be considered within a holistic approach to the problem and the effect of the adopted solutions should be quantified.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents a significant added value to the activities, and this will be reflected in the evaluation under the criteria 'Implementation and Impact'.

The participation of public authorities may also be an asset for the proposals, as public authorities own a large part of the building stock at European level.

Funding scheme: Large-scale integrating collaborative projects.

Expected impact: Compared to the applications and impacts of presently available materials with the same functionalities, the expected improvements are: (i) healthier indoor environment; (ii) lower embodied energy on materials (at least 15%); (iii) enhanced durability of materials (at least 20%); (iv) lower implementation costs, either in manufacturing or in application and use of the developed products (minus 20-30%, e.g. by combination of several functionalities in a single material); and (v) improved energy efficiency in buildings.

EeB.NMP.2013-3 Integration of technologies for energy-efficient solutions in the renovation of public buildings

Technical content/scope: Existing public-owned non-residential buildings represent a valuable asset in Europe. Many of them are in need of innovative retrofitting solutions, in particular those grouped in multi-building installations, since their energy efficiency is typically low. Moreover, due to the current economic crisis the investments in building retrofitting are limited. Breakthrough solutions are, therefore, needed which combine affordability along the whole life cycle with reduced energy use and maintenance effort and with increased durability, in innovative business models. These should be in line with current net zero energy standards and should allow upgrading in the future, as new targets in energy use and greenhouse gas emissions reduction emerge. The feasibility to transfer solutions from office buildings to social housing could also be considered. Technical solutions that address barriers such as cost-effectiveness, continued operation during renovation, inefficient and under-used sites, may be also considered.

Systemic approaches need to be developed which integrate the most promising technologies and materials, including for example: energy production and storage through a combination of renewable energy sources and zero-CO₂-emission micro-cogeneration at building level; energy use through innovative HVAC systems; solid state lighting; innovative fire-resistant insulation; light-weight components and made-to-measure solutions addressing the challenge of keeping, where necessary, the original aesthetics and architectural features; as well as nanotechnologies and smart materials promoting a building's reactive and adaptive behaviour following the outdoor/indoor conditions.

The district scale, since public buildings being often grouped in dedicated areas, as well as the interactions between buildings and the grid (i.e. impact on the energy demand) and with an eventual heating network should be considered. The integration of safety and security aspects should also be taken into account. The systemic approach should create economy of scale in the investment and improve return on investments. Energy efficiency should be addressed by proper system integration and installation, e.g. through synergy between technologies which have already been proven at a small scale and need a larger scale demonstration.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. In addition, to ensure appropriateness of business models, the participation of public building owners (local, regional or national governmental organisations) is recommended.

The proposals should cover both research and demonstration activities. Whilst there is no lower or upper limit on the requested EU contribution, the target is that proposals allocate around 50% of the total eligible costs of the project (excluding management costs) to demonstration activities and this objective will be taken into account in the evaluation under the criteria S/T Excellence and Impact.

A high replication potential is necessary. At least two demonstration sites should be considered in two different climatic conditions and with different end-uses, in order to ensure that the technologies are as widely applicable as possible. The corresponding district environment should be taken into account when defining the overall approach and should be reflected in the selection of the demonstrators.

Funding scheme: DEMO-targeted collaborative projects.

Expected impact: The innovative retrofitting solutions should be proven in the demonstration buildings as real cases. They should result in a reduction of at least 50% in energy consumption compared to the values before renovation while ensuring affordability. Therefore, associated investment costs are expected to represent a maximum of 20% of the total costs of building an equivalent new building in the same location. The replicability potential should be demonstrated and the return on investment should be around 7 years (in the case of deep retrofitting). Creation of a new generation of skilled workers and SME contractors in the construction sector, conscious of a systemic approach towards energy efficiency.

EeB.NMP.2013-4 Integrated control systems and methodologies to monitor and improve building energy performance

Technical content/scope: The monitoring of real energy use in energy-efficient buildings frequently shows major differences with respect to the predicted performance. Building energy performance simulation (BEPS) models, which have proven to be very useful to compare buildings design alternatives, have difficulties to capture the real complexities of the actual building energy performance. For instance, they do not properly consider deviations due to building fabric performance, malfunction of energy and comfort systems, differences in user behaviour and variations in climate conditions. With today's high energy prices, a monitoring of the building energy consumption, together with a good assessment on the best strategy to reduce it, is crucial in terms of savings and comfort. In addition, effective methodologies for the correct understanding of user behaviour need to be developed in the context of building energy performance.

The research focus is on developing methodologies and tools to monitor and assess real building energy performance, including user behaviour, energy systems performance and climate conditions. The new methods and tools could include energy performance diagnostics for predictive maintenance (related to different construction typologies and their thermal behaviour), and should be accurate enough to support decision making during the different stages in the life of the buildings. The effective monitoring and management of energy flows to help reduce energy consumption should be addressed. There is also a need to help standardising the measurement and characterisation of building energy performance, exploiting the latest advances in predictive analysis and modelling of thermal transfer based on multi-variable techniques and image recognition.

A holistic approach to building control and monitoring systems is required, by implementing dynamic full scale methods which accurately characterise building behaviour. High quality and reliable data acquisition methodologies are also needed. Projects should, wherever possible, address the integration of autonomous wireless sensors and sensor networks for data delivery together with smart equipment, and should also demonstrate a reduction of the typical assessment time.

If it provides added value, projects could use the developed tools and methodologies prior to a deep retrofitting, to analyse in-use building energy performance and to determine the best retrofit opportunities, as well as to calculate the savings from potential building retrofits.

Cost-effective solutions should be demonstrated in at least two different types of buildings preferentially located in regions with clearly different climate conditions and for which user behaviours are expected to differ.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding scheme: Large-scale integrating collaborative projects.

Expected impact: Significant reduction in the difference between real and predicted energy behaviour in a building, after the demonstration of the viability of the new tools and methods for measuring and analysing real building energy performance. Reduction of the typical assessment time.

EeB.NMP.2013-5 Optimised design methodologies for energy-efficient buildings integrated in the neighbourhood energy systems

Technical content/scope: The development of sustainable solutions for energy-efficient buildings properly integrated in their neighbourhood and their corresponding construction processes requires major innovations in the design tools, construction methods and management practices.

Latest advances in modelling and optimisation techniques should enable improvements in buildings design and control in order to facilitate decision-making before the construction stage. To improve the reliability of modelling tools for the construction sector, the main challenge is to ensure their interoperability and connectivity with other information systems used during the building life-cycle. Knowledge in the fields of modelling and computation should be applied to ensure the interoperability between tools from various domains and different scales in order to propose solutions adapted to collaborative multi-disciplinary work. The use of standards (e.g. ISO IFC, City GML) should be promoted, fostering interoperability.

Research activities should be focused on design at the building scale (including components and buildings systems), taking into account the adjacent systems such as district heating/cooling and decentralised thermal energy generation and other interactions with the neighbourhood. Projects should promote and set up an integrated approach in support of innovation, by providing actors with holistic methods and tools to support the optimised design of integrated energy-efficient buildings. The design phases for new buildings will be considered as priority as well as the design phases linked to retrofitting of existing buildings taking into account subsequent operation and maintenance. Knowledge based design can also be used to provide input into management systems. The Building Information Models concept and other advanced virtual approaches may also be used, including dynamic data integration. Projects should also cover validation actions on a technical level, which apply the tools on real construction projects; and on a societal level, i.e. validation with the occupants of the building. For the latter, involvement of organisations within an Integrated Project Delivery Approach, supporting a participatory design approach, could be an asset.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding scheme: Large-scale integrating collaborative projects.

Expected impact: Optimised design of integrated energy-efficient buildings, considering the different physical dimensions in a coupled and comprehensive overall way (energy, comfort, air quality, acoustics etc.), enabling actors to take validated and quantified choices as early as possible in the design/construction/operation processes on the basis of quantified performance objectives with compliance with regulation and user-oriented comfort expectations and constraints. Proper management of interactions between different building design domains. Continuity of information flows during the life of a building from design to maintenance.

EeB.NMP.2013-6 Achieving high efficiency by deep retrofitting in the case of commercial buildings

Technical content/scope: Advanced retrofitting of existing commercial buildings, such as shopping malls and multi-functional centres, or of buildings redesigned for retailing use, requires innovative approaches in order to meet targets for reduced energy use and greenhouse gas emissions. New systemic retrofitting methodologies should be developed for buildings that have redesigned functions (e.g. an industrial warehouse being changed into a shopping or leisure centre). Such methodologies could integrate smart energy management systems and local energy generation/storage solutions that fully exploit renewable energy sources. Equipment adapted to be operated in such redesigned buildings is also needed, including for instance photovoltaic panels, panel heating and cooling, heat pumps, smart grids, flexible energy storage systems (compact and seasonal solutions) as well as smart lighting systems combining natural and artificial light. Cost effective solutions integrating emerging technologies are needed, to achieve innovative industrialised solutions and products, adaptable to the final conditions of the building (size, complex shapes, finishing, etc.) and with lower implementation time and shorter interruption of the activity of the building. Solutions that enable intensification of commercial buildings operation by solving systemic inefficiencies (e.g. unutilised roofs, inaccessible site areas) may also be considered.

The redesigned indoor environments should optimise comfort and health conditions and, therefore, integrate new functionalities and solutions, such as: self-cleaning and de-polluting materials and coatings; insulating materials with integrated air ducts for central heat recovery systems; innovative acoustic solutions; cool roofs and pavements; and smart integration of vegetation in order to avoid the heat island effect.

Health, safety and security issues as well as architectural aspects and aesthetics should also be considered. Return on investment calculations based on reliable methodologies and benchmarks are needed, within a holistic perspective including the base investment, maintenance costs and energy savings. The replication potential of the systemic approach proposed should be reflected in guidelines applicable for different buildings typologies throughout Europe.

The research activities should focus on the systemic solutions for retrofitting existing commercial buildings or those redesigned for retailing use, as well as the required adaptation of equipment and material. The deliverables can, for instance, include configuration design tools, intelligent E-catalogues, logistics scenarios, templates and guidelines. Clear evidence of technical and economic viability should be provided by demonstrating the developed solutions in a real retrofitting project.

Synergies within the energy policy framework should be promoted.

Appropriate industrial standards as well as databases on buildings stock and retrofitting technologies should be taken into account.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding scheme: Large-scale integrating collaborative projects.

Expected impact: Significant improvement in primary energy demand is expected, reducing it from over 300 kWh/m² to less than 80 kWh/m² per year as an average. Subsequent reduction of greenhouse gas emissions, considering that in Europe 80% of the 2030 building stock already exists today. Increased share of renewable energy sources at least by 50% compared to the state of the art. The return on investment should be below 7 years. Creation of a new generation of skilled workers and SME contractors in the construction sector, conscious of a systemic approach towards energy efficiency.

II.5.3 'Green Cars (GC)' - Public-Private Partnership –

Cross-thematic cooperation between NMP, ICT, Energy and Transport (including Aeronautics)

The automotive industry is one of Europe's key industrial sectors, whose importance is largely derived from its linkages within the domestic and international economy and its complex value chain. It is estimated to account for close to 8% of total manufacturing value added (ca. EUR 120 billion, 2006) and about 6% of total manufacturing employment (over 2 million employees). The automotive industry also provides an indirect employment to 10-11 million persons and is one of the largest RTD investors in the EU with over EUR 20 billion annually (ca. 5% of its turnover)⁴².

The foreseeable shortage in crude oil based energy carriers is driving fears about energy security: 73% of all oil consumed in Europe is used in transport and estimates predict a doubling of passenger cars within the next 20 years. From an environmental and energy point of view there is an urgent need to find alternatives to fossil fuels in order to secure future energy supply, to guarantee the availability of appropriate material recycling technologies, and to reduce greenhouse gas emissions and other potential environmental impacts related to the automotive industry entire life-cycle. It is thus increasingly evident that a particular emphasis should be put on the rapid development of technologies supporting the massive emergence of more efficient and sustainable road transport solutions based on alternative fuels/energy, and on the RTD efforts associated with them.

The *'European Green Cars' PPP Initiative* is a series of measures boosting research and innovation aiming at facilitating the deployment of a new generation of passenger cars, trucks and buses that will spare our environment and lives and ensure jobs, economic activity and competitive advantage to car industries in the global market. A series of different measures are proposed: support to research and innovation through FP7 funding schemes, specific EIB loans to the automotive and other transport industries and its suppliers, in particular for innovative clean road transport, and a series of legislative measures to promote the greening of road transport (circulation and registration taxes, scrapping of old cars, procurement rules, the CARS21 initiative).

Other actions that are very closely related to the 'European Green Cars' Initiative but not formally included in it are being implemented, such as the 'Fuel Cell and Hydrogen' (FCH) Joint Technology Initiative and the road transport projects funded under the FP7 Transport Theme.

The 'European Green Cars' Initiative includes three major research and development avenues within its RTD pillar:

- **Research for heavy duty vehicles based on internal combustion engines (ICE)** (Sustainable Surface Transport (SST) sub-theme): The research will primarily concentrate on advanced ICE with emphasis on new combustion, the use of alternative fuels (e.g. bio-methane), intelligent control systems, 'mild' hybridisation (use of recuperated electricity to power the auxiliary systems) and special tyres for low rolling resistance.

⁴² 'European industry – a sectoral overview', 2006 update, EC DG ENTR

- **Research on electric and hybrid vehicles:** This component will be the most essential in this package. To have a real impact on the green economy, research in this field should no longer focus on electric vehicle technologies seen in isolation from the rest of the transport system: a massive introduction of the technology requires the availability of smart electricity grids and intelligent vehicle charging systems tailored to customers' needs.
- **Logistics and co-modality** combined with **intelligent transport system** technologies are essential to optimise the overall system efficiency and sustainability avoiding for example that empty trucks circulate on highways due to sub-optimal logistics. In this respect, smooth and co-operative interactions between the different transport modes will be essential.

The 2013 work programme includes three groups of topics:

- Materials for batteries, implemented through the NMP Theme.
- Development of electric vehicles for road transport and on-road charging, research for heavy duty vehicles for medium and long distance road transport, and logistics and co-modality, implemented through the Sustainable Surface Transport (SST) sub-theme of the Transport Theme.
- Architectures for electronics in the car; and comprehensive energy management systems for its infrastructure integration, implemented through the ICT Theme.

The indicative budget for 'Green Cars (GC)' is EUR 112.45 million in 2013, of which EUR 20 million is from the NMP Theme⁴³, EUR 40 million from the ICT Theme⁴⁴ and EUR 52.45 million from the Transport Theme⁴⁵.

The Transport topics of the GC initiative also support the Smart Cities Scheme, whose main call is FP7-SMARTCITIES-2013.⁴⁶

In addition, the topics ENERGY.2013.7.3.1 and ENERGY.2013.7.3.2 under the coordinated call on Smart Cities and Communities between the Energy and ICT Themes will contribute to the objectives of the GC Public-Private Partnership Initiative.

II.5.3.1 'Green Cars (GC)' Topics implemented by the NMP Theme

During the last 30 years, significant measures have been taken to improve the efficiency of vehicle propulsion systems. At the same time, the weight of cars has tended to increase in order to achieve significant improvements in terms of comfort, crashworthiness and occupant safety. Indeed the weight of a typical vehicle has increased by approximately 30% within the same class. Since the mass of the vehicle has a direct impact on the traction force required and thus fuel consumption (increasing by about 0.5l/100 km for each 100 kg of extra weight), a reversal of this trend is paramount to respect a fundamental requirement for all future automobiles to achieve the highest levels of energy efficiency possible.

⁴³ call FP7-2013-GC-MATERIALS

⁴⁴ call FP7-2013-ICT-GC

⁴⁵ part of call FP7-SST-2013-RTD-1 and call FP7-TRANSPORT-2013-MOVE-1

⁴⁶ see Theme 3 (ICT) and Theme 5 (Energy)

Moreover the range of electric vehicles, generally seen as a critical issue regarding the acceptance of such vehicles in practice, is directly related to the several factors: the efficiency of breaking energy recovery, the performance and cost of the energy storage systems, and not least the weight of the vehicle and its battery. The application of lightweight materials offers an important potential in this regard as it helps to partly compensate for some of the battery's high mass.

Correspondingly, in addition to improving recuperation, and to making batteries less expensive, improving their rechargeability and increasing their energy density, every opportunity for getting more kilometres out of the same amount of energy by has to be fully exploited in order to arrive at a product that the customer accepts and chooses to use.

Already a multitude of innovative concepts and materials are available and used in vehicles and transport carriers today; their further market uptake has been hindered to date by the relatively high costs associated with the development and implementation of advanced materials and production technologies. So, further research is needed to improve this situation.

Considering the large scope of potential novel materials applications, this call will focus on the development of innovative materials for batteries.

GC.NMP.2013-1 Improved materials for innovative ageing resistant batteries

Technical content/scope: Electric cars in the form of Battery Electric Vehicles (BEV) or Hybrid Electric Vehicles (HEV) are a key technology for reaching a cleaner and more sustainable society and its development is considered in actual Commission Policies, in particular in the PPP on Green Cars. However, a lot of challenges still have to be faced before being able to introduce electric vehicles that could perform as well as combustion engine powered vehicles, and a main issue is related to battery technology. A main challenge in this respect is to produce batteries that may provide e.g. sufficient power density, energy density and rechargeability while having a low weight and that may be quickly charged or re-charged, yet maintaining the safety that is necessary for the use in electrical vehicles. Furthermore battery production and usage should be sustainable, thereby considering a complete Life Cycle Assessment of the used solution. And finally the production and running cost and battery lifetime are other key factors. A way forward to reach this goal is looking towards new and improved battery materials. In the last years the research on battery materials technology was boosted worldwide, and huge investments were made in the development of new battery materials, going beyond the nickel based and improving the current lithium-ion technology. In order to maintain competitiveness, battery and battery cell and system production technology should be improved in Europe. The Commission reflected this in three consecutive calls related to the PPP on Green Cars, and started activities with the work programme of 2010 fostering the improvement of currently available lithium batteries, passing to its production techniques (WP 2011), and looking towards the next generation of post lithium-ion-technology (WP 2012). Some progress could be made in the last years with respect to energy density and power density, but a main problem that has not been considered thoroughly is the charging modality during practical use. Batteries may be charged slowly, overnight, or quickly in 30 minutes. New electrical grid technologies foresee also bi-directional charging/discharging as well as continuous charging. The depth of discharge (DOD) level thus may vary significantly at every single discharging cycle. Due to this usage, charging behaviour and materials lifetime are strongly affected. In practice the effects lead to a shorter battery lifetime, as after certain charging cycles only a much reduced charging capacity and respective battery power and performance remains. However, the full life-time

performance of novel electrical vehicle battery cells and systems, including those based on the current Li-Ion technology, has not thoroughly been studied so far.

Research proposals should focus on the investigation of ageing mechanisms in battery materials, including the current lithium-ion technology, in order to understand the basic physical and chemical phenomena and processes that lead to the deterioration of battery performance (at cell and system level) over time. The active materials should be considered to be already suited for automotive EV/HEV applications.

Improvements in cell chemistry (liquid or solid electrolytes, separators, additives, non electrochemically active materials, surface treatments, innovative architectures in electrode micro or nanostructure) and system (SOC strategy, thermal management) should be developed to improve the minimum residual charging capacity after a suitable amount of charging cycles. Today a life time of 10-15 years and recharging number of 1200 cycles at 80% DOD is envisaged; ideally 3000-5000 charging cycles after 10-15 years of use should be reached (new promising high energy density battery materials actually permit only about 10 charging cycles, depending on the battery technology). The performance of the newly developed aging resistant cells and systems should at least equal the energy density and power density that are reachable with existing materials, taking into account the variety of user profiles and its translation in current regimes, average DOD, external temperature variation and the like. The development of new chemistries and technologies to overcome the aging mechanism should take into account the various types of charging that occur during the lifetime of the battery, overnight charging, fast charging, recharging, grid charging and grid de-charging, charging in different climatic conditions (-20 to +50°C, for instance). In particular the effects of fast charging/discharging and deep discharging that are related to huge temperature gradients should be considered, also with respect to safety issues. The performance, lifetime and reliability of the advanced cells and battery systems should be assessed and tested under typical operational and extreme conditions with respect to durability and intrinsic safety, as well as environmental health and safety and external mechanical, electrical and climatic stress, e.g. safety after short circuit, fire and car accident/crash. Proof of concept in terms of product and/or process should be delivered within the project, excluding commercially usable prototypes (2006/C323/01), but convincingly proving scalability towards industrial needs, while maintaining the safety and the stability of the technology. Test methods and simulation tools that enable a thorough modelling and understanding of the aging and degradation processes at both cell and system levels are of great importance. Dedicated modelling can be developed to allow predicting the lifetime, reliability and residual value of the new electric vehicle battery and the results should be backed up with strong evidence provided by "post-mortem" analysis. A related testing procedure applicable at European level should be developed.

In addition to the above, the following issues have to be taken into account:

- Considering the intensive research efforts occurring in the field so far, and the dynamics of development of new knowledge, it should be thoroughly demonstrated that new developed materials and technologies permit a considerable increase with respect to the state-of-the-art. This should be underpinned by an extensive study and presentation of the existing knowledge at the date of proposals submission;
- The new technologies should permit a sustainable maintenance of the battery at cell and/or system level;
- Standardization and regulatory issues should be addressed;

- The effect of battery materials and cell production processes on the environment should be minimised,
- An appropriate Life-Cycle Analysis of the advanced materials and the respective components and systems, including dismantling and recycling technologies should be carried out;
- The life-cycle cost of the materials and assemblies as well of the production technologies should be considered by carrying out an economic analysis, including material resources availability. A thorough cost analysis should demonstrate the real advantages of the new materials, cells and systems;
- IPR issues and the use of background and foreground should be intensively discussed and the arrangements in the consortium should allow suitable access of the knowledge to all participants of the consortium, while safeguarding industrial competitiveness through adequate measures (i.e. through patents, licenses or other agreements)

Funding Scheme: Large-scale integrating collaborative projects.

Expected impact: (i) Understanding and verification of ageing and degradation processes in electrical vehicle batteries; and (ii) Considerable improvement of the battery lifetime while maintaining optimal battery performance: it should be demonstrated that the new materials used in the cells and systems would allow recharging, at system level, of a minimum of 4000 cycles at 80% DOD in typical BEV conditions over 10 to 15 years, while maintaining energy densities of at least 250 Wh/kg over the lifetime and permitting a considerable reduction of the battery "memory effect"; and (iii) Economic viability and technological feasibility of the advanced materials and the related processes with reference to real applications of industrial relevance; and/or (iv) Improvement of European battery production capacities; and/or (v) Options for the use of environmentally friendly and sustainable materials.

III. IMPLEMENTATION OF CALLS

III.1 Calls for proposals NMP-2013

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies – LARGE 2013

- **Call identifier: FP7-NMP-2013-LARGE-7**
- **Date of publication⁴⁷:** 10 July 2012
- **Deadline⁴⁸:** first stage: **23 October 2012** at 17.00.00 (Brussels local time)
- **Indicative budget: EUR 158 million⁴⁹.** The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call.
- **Topics called:**

Activity/ Area	Topics called	Funding Schemes
Maximising the contribution of nanotechnology to sustainable development	1.1-1 Exploration, optimisation and control of nano-catalytic processes for energy applications	<i>Large-scale integrating Collaborative Projects</i>
Nanotechnology for benefiting environment, energy and health	1.2-2 Nanotherapeutics to treat bacterial infectious diseases	
Ensuring the safety of Nanotechnology	1.3-1 Safety in nanoscale production and products	
	1.3-3 Development of a systematic framework for naming and assessing safety of the next generations of nanomaterials being developed for industrial applications	
Cross-cutting and enabling R&D	1.4-2 Metrology research for the development and validation of design rules for engineering of nanostructured and nano-enabled materials and devices	
	1.4-3 Development of methods and standards supporting the implementation of the Commission recommendation for a definition of nanomaterial	

⁴⁷ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁴⁸ The Director-General responsible may delay this deadline by up to two months.

⁴⁹ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority

Enabling R&D	2.1-1 Developing new precursors, functionalisations and processing routes for carbon fibres	
Innovative materials for advanced applications	2.2-3 Wide band gap semiconductor materials and structures for power electronics in energy technologies	
Integration	4.0-1 Graphene production technologies	
Raw materials	4.1-2 Breakthrough Solutions for Mineral Extraction and Processing in Extreme Environments	

- **Eligibility conditions:**

The general eligibility criteria are set out in Annex 2 to this Work Programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

The minimum conditions to participate are: at least three independent legal entities, each of which is established in a Member State or Associated Country, and no two of which are established in the same Member State or Associated Country.

The eligibility criteria apply to both first and second stage proposals. At stage 1, only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds, while part B will be used to check the number of eligible participants. At stage 2, part A will be used alone to determine these eligibility conditions.

In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Large-scale integrating collaborative projects **the minimum requested EU contribution must be greater than EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

The following topics have an **additional eligibility criterion**:

- NMP.2013.1.3-3 – Development of a systematic framework for naming and assessing safety of the next generations of nanomaterials being developed for industrial applications: The requested EU contribution must not exceed EUR 7 000 000 per project.
- NMP.2013.1.4-3 – Development of methods and standards supporting the implementation of the Commission recommendation for a definition of nanomaterial: The requested EU contribution must not exceed EUR 7 000 000 per project.

- **Evaluation procedure:**

The evaluation shall follow a two-stage procedure. The first stage proposal, of a maximum of 10 pages (A4 pages; font size 11 points; top, bottom, left right margins: 15mm), should focus on the S&T content and on clear identification of the intended results, their intended use and the expected impact (economic, social, environmental, etc.), plus 2 pages to describe the

consortium and the estimated financial resources involved. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission. The Commission will instruct the experts to disregard any pages exceeding these limits.

Stage 1 proposals will be evaluated remotely. Stage 1 proposals shall be submitted at the closure date mentioned above. Coordinators of retained proposals in stage 1 ('go' proposals) will be invited to submit a complete proposal that will be then evaluated against the entire set of evaluation criteria. The closure date of the second submission will be specified in the invitation to submit the complete proposal. The indicative closure date is: **19 March 2013**. Experts will carry out the individual evaluation of proposals remotely.

For this call, the following criteria and thresholds are applied:

- Evaluation criteria and thresholds for stage 1 proposals:

Stage 1 proposals are evaluated on the basis of the following two criteria: **S/T quality and Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	4/5
Impact	3/5
Overall threshold required	8/10

Coordinators of retained proposals in stage 1 ('go' proposals) will receive the Evaluation Summary Report without scores. They will be invited to submit a complete proposal that will be then evaluated against the entire set of evaluation criteria.

- Evaluation criteria and thresholds for stage 2 proposals:

Stage 2 proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	4/5
Implementation	3/5
Impact	4/5
Overall threshold required	12/15

In order to ensure industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

See also Annex 2: Eligibility and evaluation criteria for proposals. Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

In contrast with Annex 2 to this Work Programme, at panel stage, the priority order of the proposals with equal overall scores will be established in accordance with their scores for the S/T Quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If proposals are still tied, they will be prioritised on the basis of the Work Programme coverage.

- **Indicative timetable:**

Evaluation Stage-1 proposals: November 2012; Evaluation Stage-2 proposals: April 2013. Evaluation results: estimated to be available within two months after the call closure date. A reserve list of projects may be established.

- **Consortium agreements:**

Participants are required to conclude a consortium agreement.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Use of flat rates for subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents, under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies – SMALL 2013

- **Call identifier:** FP7-NMP-2013-SMALL-7
- **Date of publication**⁵⁰: 10 July 2012
- **Deadline**⁵¹: first stage: **23 October 2012** at 17.00.00 (Brussels local time)
- **Indicative budget: EUR 82 million**⁵². The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call.
- **Topics called:**

Activity/ Area	Topics called	Funding Schemes
Maximising the contribution of nanotechnology to sustainable development	1.1-2 Self-assembly of naturally occurring nanosystems	Small or medium-sized collaborative projects
Nanotechnology for benefiting environment, energy and health	1.2-1 Nanotechnology-based sensors for environmental monitoring	
Ensuring the safety of Nanotechnology	1.3-2 Nanomaterials safety assessment: Ontology, database(s) for modelling and risk assessment	
Cross-cutting and enabling R&D	1.4-1 Development of an integrated multi-scale modelling environment for nanomaterials and systems by design	
Innovative materials for advanced applications	2.2-4 Materials solutions for durable energy-harvesters	
New Production	3.0-1 Tools for Monitoring and Assessing Resource-efficiency in the Value Chain of process Industries	
Integration	4.0-2 Innovative materials for efficient, stable and cheap organic photovoltaic cells	

- **Eligibility conditions:**

⁵⁰ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁵¹ The Director-General responsible may delay this deadline by up to two months.

⁵² Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority

The general eligibility criteria are set out in Annex 2 to this Work Programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

The minimum conditions to participate are: at least three independent legal entities, each of which is established in a Member State or Associated Country, and no two of which are established in the same Member State or Associated Country.

The eligibility criteria apply to both first and second stage proposals. At stage 1, only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds, while part B will be used to check the number of eligible participants. At stage 2, part A will be used alone to determine these eligibility conditions.

In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Small or medium-sized collaborative projects **the maximum requested EU contribution must not exceed EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

- **Evaluation procedure:**

The evaluation shall follow a two-stage procedure. The first stage proposal, of a maximum of 10 pages (A4 pages; font size 11 points; top, bottom, left right margins: 15mm), should focus on the S&T content and on clear identification of the intended results, their intended use and the expected impact (economic, social, environmental, etc.), plus 2 pages to describe the consortium and the estimated financial resources involved. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission. The Commission will instruct the experts to disregard any pages exceeding these limits.

Stage 1 proposals will be evaluated remotely. Stage 1 proposals shall be submitted at the closure date mentioned above. Coordinators of retained proposals in stage 1 ('go' proposals) will be invited to submit a complete proposal that will be then evaluated against the entire set of evaluation criteria. The closure date of the second submission will be specified in the invitation to submit the complete proposal. The indicative closure date is: **19 March 2013**. Experts will carry out the individual evaluation of proposals remotely.

For this call, the following criteria and thresholds are applied:

- Evaluation criteria and thresholds for stage 1 proposals:

Stage 1 proposals are evaluated on the basis of the following two criteria: **S/T quality and Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	4/5
Impact	3/5
Overall threshold required	8/10

Coordinators of retained proposals in stage 1 ('go' proposals) will receive the Evaluation Summary Report without scores. They will be invited to submit a complete proposal that will be then evaluated against the entire set of evaluation criteria.

- Evaluation criteria and thresholds for stage 2 proposals:

Stage 2 proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	4/5
Implementation	3/5
Impact	3/5
Overall threshold required	12/15

See also Annex 2: Eligibility and evaluation criteria for proposals. Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

In contrast with Annex 2 to this Work Programme, at panel stage, the priority order of the proposals with equal overall scores will be established in accordance with their scores for the S/T Quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If proposals are still tied, they will be prioritised on the basis of the Work Programme coverage.

- **Indicative timetable:**

Evaluation Stage-1 proposals: November 2012; Evaluation Stage-2 proposals: April 2013. Evaluation results: estimated to be available within two months after the call closure date. A reserve list of projects may be established.

- **Consortium agreements:**

Participants are required to conclude a consortium agreement.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Use of flat rates for subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents, under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies – SMEs 2013

- **Call identifier: FP7-NMP-2013-SME-7**
- **Date of publication**⁵³: 10 July 2012
- **Deadline**⁵⁴: first stage: **23 October 2012** at 17.00.00 (Brussels local time)
- **Indicative budget: EUR 39.3 million**⁵⁵. The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call.
- **Topics called:**

Activity/ Area	Topics called	Funding Schemes
Innovative materials for advanced applications	2.2-1 Biomaterials for Advanced Therapies and Medical Devices in the neurological/neuromuscular or cardiovascular fields	<i>SME-targeted collaborative projects</i>
New Production	3.0-2 Integrated processing and Control Systems for Sustainable Production in Farms and Forests	
Integration	4.0-3 From research to innovation: substantial steps forward in the industrial use of European intellectual assets, stimulating the use of newly developed materials and materials technologies by the industry	

- **Eligibility conditions:**

The general eligibility criteria are set out in Annex 2 to this Work Programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

The minimum conditions to participate are: at least three independent legal entities, each of which is established in a Member State or Associated Country, and no two of which are established in the same Member State or Associated Country.

The eligibility criteria apply to both first and second stage proposals. At stage 1, only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds, while part B will be used to check the number of eligible participants. At stage 2, part A will be used alone to determine these eligibility conditions.

- **Additional eligibility criterion:**

SME-targeted Collaborative Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 35% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

⁵³ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁵⁴ The Director-General responsible may delay this deadline by up to two months.

⁵⁵ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority

• **Evaluation procedure:**

The evaluation shall follow a two-stage procedure. The first stage proposal, of a maximum of 10 pages (A4 pages; font size 11 points; top, bottom, left right margins: 15mm), should focus on the S&T content and on clear identification of the intended results, their intended use and the expected impact (economic, social, environmental, etc.), plus 2 pages to describe the consortium and the estimated financial resources involved. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission. The Commission will instruct the experts to disregard any pages exceeding these limits.

Stage 1 proposals will be evaluated remotely. Stage 1 proposals shall be submitted at the closure date mentioned above. Coordinators of retained proposals in stage 1 ('go' proposals) will be invited to submit a complete proposal that will be then evaluated against the entire set of evaluation criteria. The closure date of the second submission will be specified in the invitation to submit the complete proposal. The indicative closure date is: **19 March 2013**. Experts will carry out the individual evaluation of proposals remotely.

For this call, the following criteria and thresholds are applied:

- Evaluation criteria and thresholds for stage 1 proposals:

Stage 1 proposals are evaluated on the basis of the following two criteria: **S/T quality and Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	4/5
Impact	3/5
Overall threshold required	8/10

Coordinators of retained proposals in stage 1 ('go' proposals) will receive the Evaluation Summary Report without scores. They will be invited to submit a complete proposal that will be then evaluated against the entire set of evaluation criteria.

- Evaluation criteria and thresholds for stage 2 proposals:

Stage 2 proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	4/5
Implementation	3/5
Impact	3/5
Overall threshold required	12/15

In order to ensure industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

In order to ensure an efficient implementation and maximum impact of SME-related activities, the following aspects will be evaluated under the criteria 'Implementation' and 'Impact':

– the leading role of SMEs with R&D capacities: the coordinator does not need to be an SME but the participating SMEs should have the decision making power in the project management and the output should be for the benefit of the participating SMEs and the targeted SME dominated industrial communities; and

– level of SME involvement. Please take note of the additional eligibility criterion above.

See also Annex 2: Eligibility and evaluation criteria for proposals. Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

In contrast with Annex 2 to this Work Programme, at panel stage, the priority order of the proposals with equal overall scores will be established in accordance with their scores for the S/T Quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If proposals are still tied, they will be prioritised on the basis of the Work Programme coverage.

- **Indicative timetable:**

Evaluation Stage-1 proposals: November 2012; Evaluation Stage-2 proposals: April 2013. Evaluation results: estimated to be available within two months after the call closure date. A reserve list of projects may be established.

- **Consortium agreements:**

Participants are required to conclude a consortium agreement.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Use of flat rates for subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents, under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies – CSAs 2013

- **Call identifier:** FP7-NMP-2013-CSA-7
- **Date of publication**⁵⁶: 10 July 2012
- **Deadline**⁵⁷: **4 December 2012** at 17.00.00 (Brussels local time)
- **Indicative budget: EUR 13.9 million**⁵⁸. The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call.
- **Topics called:**

Activity/ Area	Topics called	Funding Schemes
Cross-cutting and enabling R&D	1.4-4 Developing innovative outreach and dialogue on responsible nanotechnologies in EU civil society – Support actions	Coordination and Support Actions
Structuring actions	2.3-1 Advanced materials – our allies for a sustainable future – Support actions	
	2.3-2 Rational design of functional materials: networking and sharing of best practices – Coordination action	
Integration	4.0-4 Support for cluster activities of projects in the main application fields of NMP Theme – Coordination actions	
	4.0-5 Deployment of societally beneficial nano- and/or materials technologies in ICP countries – Support actions	
	4.0-6 Safe Life Extension management of aged transport infrastructures networks and industrial plants – Coordination actions	
	4.0-8 The impact of the integration of key enabling technologies on industrial production and societal goals – Support actions	
	4.0-9 Organisation of events related to the Presidencies of the European Union – Support actions	
Raw materials	4.1-3 European Intelligence Network on the Supply of Raw Materials – Coordination action	

- **Eligibility conditions:**

The general eligibility criteria are set out in Annex 2 to this Work Programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

⁵⁶ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁵⁷ The Director-General responsible may delay this deadline by up to two months.

⁵⁸ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority

- Coordination and support actions – coordinating actions: at least three independent legal entities, each of which is established in a Member State or Associated Country, and no two of which are established in the same Member State or Associated Country.
- Coordination and support actions – supporting actions: at least one independent legal entity.

The following topics have **additional eligibility criteria**:

- NMP.2013.1.4-4 – Developing innovative outreach and dialogue on responsible nanotechnologies in EU civil society: the requested EU contribution must not exceed EUR 2 000 000 per project.
- NMP.2013.4.0-6 – Safe Life Extension management of aged transport infrastructures networks and industrial plants: the requested EU contribution must not exceed EUR 1 000 000 per project.
- NMP.2013.4.0-8 – The impact of the integration of key enabling technologies on industrial production and societal goals: the requested EU contribution must not exceed EUR 1 000 000 per project, and the project duration must not exceed 18 months.
- NMP.2013.4.1-3 – European Intelligence Network on the Supply of Raw Materials: the requested EU contribution must not exceed EUR 2 000 000 per project.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Evaluation procedure:**

The evaluation shall follow a single-stage procedure. The evaluation criteria and scoring scheme are set out in Annex 2 to this Work Programme.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

Experts will carry out the individual evaluation of proposals remotely.

- Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

See also Annex 2: Eligibility and evaluation criteria for proposals. Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

In contrast with Annex 2 to this Work Programme, at panel stage, the priority order of the proposals with equal overall scores will be established in accordance with their scores for the S/T Quality criterion. If they are still tied, they will be prioritised according to their scores for

the Impact criterion. If proposals are still tied, they will be prioritised on the basis of the Work Programme coverage.

- **Indicative timetable:**

Evaluation: January 2013. Evaluation results: estimated to be available within two months after the call closure date. A reserve list of projects may be established.

- **Consortium agreements:**

Participants are required to conclude a consortium agreement.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Use of flat rates for subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents, under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies – Coordinated call EU-China 2013

- **Call identifier: FP7-NMP-2013-EU-China**
- **Date of publication⁵⁹:** 10 July 2012
- **Deadline⁶⁰:** 23 October at 17.00.00 (Brussels local time)
- **Indicative budget: EUR 5 million⁶¹** by EU – NMP Theme. The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call. An equivalent budget for the call is expected from the National Natural Science Foundation of China (NSFC).
- **Topic called:**

Activity/ Area	Topics called	Funding Schemes
Innovative materials for advanced applications	2.2-2 Biomaterials: Imaging and rapid precise prototyping technology for custom made scaffolds	Small or medium-sized collaborative projects

The coordinated call EU-China foresees coordinated projects to be financed by the European Union and by the Chinese funding agency respectively. Two calls are published – one by the European Commission according to FP7 rules and the other by the NSFC under its own rules.

- **Eligibility conditions:**

The coordinated call on the topic above is launched by the EU (this call) and the NSFC, each according to its respective rules.

The general eligibility criteria are set out in Annex 2 to this Work Programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

The minimum conditions to participate are: at least three independent legal entities, each of which is established in a Member State or Associated Country, and no two of which are established in the same Member State or Associated Country.

- **Additional eligibility criteria:**

Proposals which do not include coordination with a Chinese project will be considered ineligible.

The maximum requested EU contribution must not exceed EUR 1 800 000 per project.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Evaluation procedure:**

⁵⁹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁶⁰ The Director-General responsible may delay this deadline by up to two months.

⁶¹ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority

The evaluation shall follow a single-stage procedure. The evaluation criteria and scoring scheme are set out in Annex 2 to this Work Programme.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

Experts will carry out the individual evaluation of proposals remotely. The proposals will be evaluated by a panel selected jointly by the European Commission and NSFC.

For each project, a proposal in English needs to be prepared jointly by the European and Chinese partners involved. All proposals need to be submitted electronically through the electronic Submission Services of the Commission. Only proposals received through the electronic Submission Services of the Commission will be used in the joint evaluation. These proposals need to:

- follow the part B template available through the electronic Submission Services of the Commission and instructions that will be published together with the call text in the Guide for Applicants;
- list the European participants and provide a detailed breakdown of costs and requested funding for the European participants in part A; and
- list all participants from both Europe and China, and describe the work and effort on both sides and how the coordinated projects outlined above are integrated, in part B of the proposal.

The Chinese partners will submit a proposal following the NSFC template and requirements, to the NSFC. This will include in annex the English version as submitted to the EC. The NSFC will treat the annexed proposals as confidential documents.

After the deadline for submission of proposals the EC and NSFC will exchange the lists of proposals received.

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	4/5
Implementation	3/5
Impact	4/5
Overall threshold required	12/15

In order to ensure a genuine EU-China cooperation, a balanced effort between the coordinated projects and a research plan properly involving coordinated research activities between Europe and China represent an added value to the activities and this will be reflected in the evaluation, under the criteria Impact and Implementation.

In terms of reciprocity, non-confidential abstracts of EU retained proposals will be made available to the NSFC.

See also Annex 2: Eligibility and evaluation criteria for proposals. Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

- **Additional selection criterion:**

Proposals will only be selected on the condition that their coordinated Chinese project(s) will be selected by the NSFC.

- **Indicative timetable:**

Evaluation: November-December 2012. Evaluation results: estimated to be available by January 2013. A reserve list of projects may be established. Negotiations will be carried out in parallel by the EU and the NSFC.

- **Consortium agreements:**

Participants are required to conclude a consortium agreement. In addition, participants in the EU projects are required to conclude a coordination agreement with the participants in the coordinated project funded by the NSFC. A final draft of these agreements has to be provided with the proposal.

- **Special feature:**

The proposals should also take into account the exchange of researchers, so that any accommodation (board and lodging) of the Chinese researchers in Europe should be paid by the European host institution, whereas that of the European researchers in China should be paid by the Chinese host institution.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Use of flat rates for subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents,

under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies – Coordinated call EU-Japan 2013

- **Call identifier: FP7-NMP-2013-EU-Japan**
- **Date of publication⁶²:** 10 July 2012
- **Deadline⁶³:** 23 October 2012 at 17.00.00 (Brussels local time)
- **Indicative budget: EUR 5 million⁶⁴** by EU – NMP Theme. The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call. An equivalent budget for the call is expected from the Japan Science and Technology Agency (JST).
- **Topic called:**

Activity/ Area	Topics called	Funding Schemes
Raw materials	4.1-1 Development of new materials for the substitution of critical metals	Small or medium-sized collaborative projects

The coordinated call EU-Japan foresees coordinated projects to be financed by the European Union and by the Japanese funding agency respectively. Two calls are published – one by the European Commission according to FP7 rules and the other by the JST under its own rules.

- **Eligibility conditions:**

The coordinated call on the topic above is launched by the EU (this call) and the JST, each according to its respective rules.

The general eligibility criteria are set out in Annex 2 to this Work Programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

The minimum conditions to participate are: at least three independent legal entities, each of which is established in a Member State or Associated Country, and no two of which are established in the same Member State or Associated Country.

- **Additional eligibility criteria:**

Proposals which do not include coordination with a Japanese project will be considered ineligible. Therefore, each EU project proposal must include (in an annex separate from part B) a reference and description of the proposal submitted for funding to the JST. A proposal will be evaluated on the condition that the corresponding coordinated Japanese project proposal is presented for funding to the JST.

The maximum requested EU contribution must not exceed EUR 1 800 000 per project.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

⁶² The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁶³ The Director-General responsible may delay this deadline by up to two months.

⁶⁴ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority

- **Evaluation procedure:**

The evaluation shall follow a single-stage procedure. The evaluation criteria and scoring scheme are set out in Annex 2 to this Work Programme.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

Experts will carry out the individual evaluation of proposals remotely. The proposals will be evaluated by a panel which may include Japanese experts.

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

In order to ensure a genuine EU-Japan cooperation, a balanced effort between the coordinated projects and a research plan properly involving coordinated research activities between Europe and Japan represent an added value to the activities and this will be reflected in the evaluation, under the criteria Impact and Implementation.

In terms of reciprocity, non-confidential abstracts of EU retained proposals will be made available to the JST.

See also Annex 2: Eligibility and evaluation criteria for proposals. Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

- **Additional selection criterion:**

Proposals will only be selected on the condition that their coordinated Japanese project(s) will be selected by the JST.

- **Indicative timetable:**

Evaluation: November 2012 /February 2013. Evaluation results: estimated to be available by April 2013. A reserve list of projects may be established. Negotiations will be carried out in parallel by the EU and the JST. A fixed starting date of 1 September 2013 of the respective grant agreements is envisaged.

- **Consortium agreements:**

Participants are required to conclude a consortium agreement. In addition, participants in the EU projects are required to conclude a coordination agreement with the participants in the coordinated project funded by the JST. A final draft of these agreements has to be provided with the proposal.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Use of flat rates for subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents, under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

III.2 Calls for proposals Public-Private Partnerships

Public-Private Partnership ‘Factories of the Future’ - Cross-Thematic call implemented between NMP and ICT

Call title: ‘Factories of the Future’ - 2013

- **Call identifier:** FP7-2013-NMP-ICT-FoF
- **Date of publication:** 10 July 2012⁶⁵
- **Deadline:** 4 December 2012⁶⁶ at 17.00.00 (Brussels local time).
- **Indicative budget**^{67 68}: EUR 230 million from the 2013 budget of which:
 - EUR 160 million from Theme 4 – Nanosciences, Nanotechnologies, Materials and New Production Technologies
 - EUR 70 million from Theme 3 – Information and Communication Technologies (ICT)
- **Topics called:**

Activity/ Area	Topics called	Funding Schemes	Budget (Million EUR)
NMP – Nanosciences, nanotechnologies, Materials and new Production			
FoF.NMP.2013-1	Improved use of renewable resources at factory level	DEMO-targeted collaborative projects	160
FoF.NMP.2013-2	Innovative re-use of modular equipment based on integrated factory design	DEMO-targeted collaborative projects	
FoF.NMP.2013-3	Workplaces of the future: the new people-centred production site	Small or medium-sized collaborative projects	
FoF.NMP.2013-4	Innovative methodologies addressing social sustainability in manufacturing	Coordination and Support Actions (Support action)	

⁶⁵ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

⁶⁶ The Director-General responsible may delay this deadline by up to two months

⁶⁷ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- the final budget of the call may vary by up to 10% of the total value of the indicated budget for the call; and
- any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

⁶⁸ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority

FoF.NMP.2013-5	Innovative design of personalised product-services and of their production processes based on collaborative environments	Large-scale integrated collaborative projects	
FoF.NMP.2013-6	Mini-factories for customised products using local flexible production	DEMO-targeted collaborative projects	
FoF.NMP.2013-7	New hybrid production systems in advanced factory environments based on new human-robot interactive cooperation	Large-scale integrated collaborative projects	
FoF.NMP.2013-8	Innovative strategies for renovation and repair in manufacturing systems	Large-scale integrated collaborative projects	
FoF.NMP.2013-9	Advanced concepts for technology-based business approaches addressing product-services and their manufacturing in globalised markets	Small or medium-sized collaborative projects	
FoF.NMP.2013-10	Manufacturing processes for products made of composites or engineered metallic materials	Small or medium-sized collaborative projects	
FoF.NMP.2013-11	Manufacturing of highly miniaturised components	SME-targeted collaborative projects	
ICT – Information and Communication Technologies			
FoF-ICT-2013.7.1	Application experiments for robotics and simulations	<i>Collaborative Projects (IP only) and CSA</i>	70
FoF-ICT-2013.7.2	Equipment assessment for sensor and laser based applications	<i>Collaborative Projects (IP only) and CSA</i>	

- **Eligibility conditions**

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation: For Collaborative projects, the minimum condition shall be the participation of 3 independent legal entities, each of which is established in a Member State or Associated Country and no two of which are established in the same Member State or Associated Country.

For Coordination and Support Actions, the minimum conditions shall be:

- Coordination and Support Actions – **coordinating actions**: at least 3 independent legal entities, each of which is established in a Member State or Associated Country, and no 2 of which are established in the same Member State or Associated Country.
- Coordination and Support Actions – **supporting actions**: at least 1 independent legal entity.

- **Additional eligibility criteria**

Topics FoF.NMP.2013-5, FoF.NMP.2013-7 and FoF.NMP.2013-8: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Large-scale integrating collaborative projects **the minimum requested EU contribution must be greater than EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

Topics FoF.NMP.2013-3, FoF.NMP.2013-9 and FoF.NMP.2013-10: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Small or medium-sized collaborative projects **the maximum requested EU contribution must not exceed EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

Topic FoF.NMP.2013-11: SME-targeted Collaborative Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 35% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Topic FoF.NMP.2013-4: The requested EU contribution must not exceed EUR 500 000 per project, and the project duration must not exceed 18 months.

For the ICT topics, each proposal must indicate the type of funding scheme used (IP for Collaborative Projects where applicable; CA or SA for Coordination and Support Actions). See Appendix 2 to the ICT chapter of the Cooperation work programme for further details.

- **Evaluation procedure**

A one-stage submission procedure will be followed.

Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

Each Theme will remain responsible for its own budget and for the implementation of the respective call topics. This includes drawing up ranking lists per Theme and subsequent negotiation and follow-up of the grant agreements resulting from proposals selected under the respective call topics.

For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
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S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

See also Annex 2: Eligibility, Evaluation criteria for proposals and priority order for proposals with the same score⁶⁹.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

- **Indicative evaluation and contractual timetable**

Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

- **Consortium agreements**

Participants are required to conclude a consortium agreement.

- **Particular requirements for participation, evaluation and implementation:**

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up by each Theme as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.
- **Use of flat rates for subsistence costs**

For topics FoF.NMP.2013, and in accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:

http://ec.europa.eu/research/participants/portal/page/fp7_documents,

under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

⁶⁹ For topics FoF.NMP.2013, and in contrast with Annex 2, at Panel stage, the priority order of the proposals with equal overall scores will be established in accordance with their scores for the S/T Quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If proposals are still tied, they will be prioritised on the basis of the work programme coverage.

Public-Private Partnership ‘Energy-efficient Buildings’ – Cross-Thematic call implemented between NMP and ENVIRONMENT (including Climate Change)

Call title: ‘Energy-efficient Buildings’ - 2013

- **Call identifier:** FP7-2013-NMP-ENV-EeB
- **Date of publication:** 10 July 2012⁷⁰
- **Deadline:** 4 December 2012⁷¹ at 17.00.00 (Brussels local time).
- **Indicative budget**^{72 73}: EUR 116 million from the 2013 budget of which:
 - EUR 110 million from Theme 4 – Nanosciences, Nanotechnologies, Materials & New Production Technologies
 - EUR 6 million from Theme 6 – Environment (including Climate Change)
- **Topics called:**

Activity/ Area	Topics called	Funding Schemes	Budget (Million EUR)
NMP – Nanosciences, nanotechnologies, Materials and new Production			
EeB.NMP.2013-1	Nanotechnology for multifunctional lightweight construction materials and components	Small or medium-sized collaborative projects	110
EeB.NMP.2013-2	Safe, energy-efficient and affordable eco-innovative materials for building envelopes and/or partitions to provide a healthier indoor environment	Large-scale integrated collaborative projects	
EeB.NMP.2013-3	Integration of technologies for energy-efficient solutions in the renovation of public buildings	DEMO-targeted collaborative projects	
EeB.NMP.2013-4	Integrated control systems and methodologies to monitor and improve	Large-scale integrated	

⁷⁰ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

⁷¹ The Director-General responsible may delay this deadline by up to two months

⁷² The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- the final budget of the call may vary by up to 10% of the total value of the indicated budget for the call; and
- any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

⁷³ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority

	building energy performance	collaborative projects	
EeB.NMP.2013-5	Optimised design methodologies for energy-efficient buildings integrated in the neighbourhood energy systems	Large-scale integrated collaborative projects	
EeB.NMP.2013-6	Achieving high efficiency by deep retrofitting in the case of commercial buildings	Large-scale integrated collaborative projects	
Environment (including Climate Change)			
EeB.ENV.2013.6.3-4	Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts	Collaborative Project	6

- **Eligibility conditions**

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation: For Collaborative projects, the minimum condition shall be the participation of 3 independent legal entities, each of which is established in a Member State or Associated Country and no two of which are established in the same Member State or Associated Country.

For Coordination and Support Actions, the minimum conditions shall be:

- Coordination and Support Actions – coordinating actions: at least 3 independent legal entities, each of which is established in a Member State or Associated Country, and no 2 of which are established in the same Member State or Associated Country.
- Coordination and Support Actions – supporting actions: at least 1 independent legal entity.

- **Additional eligibility criteria**

Topics EeB.NMP.2013-2, EeB.NMP.2013-4, EeB.NMP.2013-5 and EeB.NMP.2013-6: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Large-scale integrating collaborative projects **the minimum requested EU contribution must be greater than EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

Topic EeB.NMP.2013-1: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Small or medium-sized collaborative projects **the maximum requested EU contribution must not exceed EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

Topic EeB.ENV.2013.6.3-4: In addition to the general eligibility criteria, which are given in Annex 2 of the work programme, for collaborative projects in the maximum EC funding requested must not exceed EUR 3 million. The following additional eligibility criterion will be also applied: Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

- **Evaluation procedure**

A one-stage submission procedure will be followed.

Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

Each Theme will remain responsible for its own budget and for the implementation of the respective call topics. This includes drawing up ranking lists per Theme and subsequent negotiation and follow-up of the grant agreements resulting from proposals selected under the respective call topics.

For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

See also Annex 2: Eligibility, Evaluation criteria for proposals and priority order for proposals with the same score⁷⁴.

⁷⁴ For topics EeB.NMP.2013, and in contrast with Annex 2, at Panel stage, the priority order of the proposals with equal overall scores will be established in accordance with their scores for the S/T Quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If proposals are still tied, they will be prioritised on the basis of the work programme coverage.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

- **Indicative evaluation and contractual timetable**

Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

- **Consortium agreements**

Participants are required to conclude a consortium agreement.

- **Particular requirements for participation, evaluation and implementation:**

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up by each Theme as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Use of flat rates for subsistence costs**

For topics EeB.NMP.2013 and EeB.ENV.2013, and in accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:

http://ec.europa.eu/research/participants/portal/page/fp7_documents,

under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

Public-Private Partnership ‘Green Cars’ – Call implemented by NMP Theme

Call title: Materials for Green Cars - 2013

Call identifier: FP7-2013-GC-MATERIALS

Date of publication: 10 July 2012⁷⁵

Deadline: 4 December 2012⁷⁶ at 17.00.00 (Brussels local time).

Indicative budget^{77 78}: **EUR 20 million** from the 2013 budget.

The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call.

Topics called:

Activity/ Area	Topics called	Funding Schemes	Budget Million EUR
GC.NMP.2013-1	Improved materials for innovative ageing resistant batteries	Large-scale integrated collaborative projects	20

• **Eligibility conditions**

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation: For Collaborative projects, the minimum condition shall be the participation of 3 independent legal entities, each of which is established in a Member State or Associated Country and no two of which are established in the same Member State or Associated Country

• **Additional eligibility criteria**

Topic GC.NMP.2013-1: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Large-scale integrating collaborative projects **the minimum requested EU contribution must be greater than EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

⁷⁵ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁷⁶ The Director-General responsible may delay this deadline by up to two months.

⁷⁷ A single reserve list will be constituted if there are a sufficient number of good quality proposals. It will be used if extra budget becomes available.

⁷⁸ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

- **Evaluation procedure**

A one-stage submission procedure will be followed.

Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

- **Indicative evaluation and contractual timetable**

Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

- **Consortium agreements**

Participants are required to conclude a consortium agreement.

- **Particular requirements for participation, evaluation and implementation**

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Use of flat rates for subsistence costs**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:

http://ec.europa.eu/research/participants/portal/page/fp7_documents,

under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

III.3 ERA-NET and ERA-NET Plus topics

The topic to be implemented via **ERA-NET** under Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies – is included in the single ERA-NET coordinated call and is described in Annex 4. This topic is shown below:

Activity/ Area	Topics called	Budget Million EUR
ERA-NET and ERA-NET Plus	NMP.2013.4.0-7 ERA-NET to support Innovation in the NMP thematic area	1.5

IV. OTHER ACTIONS AND PUBLIC PROCUREMENT

IV.1 OTHER ACTIONS⁷⁹

The funding of projects through the above schemes and the development of the programme will be supported by:

- the use of appointed **independent experts** for the evaluation of project proposals, as independent observers at these evaluations where appropriate, for the reviewing of running projects, and for focus groups (evaluation);

Funding Scheme: Coordination and Support Action (supporting actions) - appointment letter

Indicative Budget: EUR 2 500 000

⁷⁹ In accordance with Articles 14, 17 and 27 of the Regulation No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

IV.2 PUBLIC PROCUREMENT IN 2013

(1) New calls for tenders leading to framework contracts not using budget in 2013

NONE

(2) Specific contracts to be concluded in 2013 under existing framework contracts

a) **Project Technical Assistants (PTA)**

Subject: External assistance to enable detailed, prompt, pro-active, and scientifically competent follow-up by the Commission of NMP projects.

Contracts: Up to 6 specific contracts with durations up to end August 2016.

Indicative budget: maximum EUR 2 200 000 in 2013.

b) **Exploitation Strategy and Innovation Consultants (ESIC)**

Subject: External assistance to identify and address possible or actual obstacles to the future or imminent exploitation of the intended or already achieved results of projects (this includes Exploitation Strategy Seminars, support to standardisation, support to business plan development, and support to patenting).

Contracts: Up to 12 specific contracts with duration of up to 6 months.

Indicative budget: maximum EUR 1 000 000 in 2013.

c) **Providing data for monitoring nanotechnologies**

Subject: Providing systematic and up-to-date global, national and sectoral monitoring and information for nanotechnologies (nanomaterials, nano-intermediates, nano-enabled products), taking into account all factors affecting the value chains and markets, especially the safety, regulatory and societal aspects. This will include assessing the impact of nanotechnology related policy measures and action plans.

Contracts: Up to 5 specific contracts with duration of up to 12 months.

Indicative budget: maximum EUR 2 000 000 in 2013.

(3) New procurement procedures leading to direct contracts

a) Ex post evaluation and impact assessment of funding in the NMP area

Subject: The aim of the study is twofold:

- Evaluating, on the basis of the outcomes of a sample of funded projects, the effectiveness of the thematic area "Nano-technologies and nano-sciences, materials and new production technologies" (NMP) within the 7th Framework Programme for research, technological development and demonstration (FP7), as well as the factors that influence the success and/or failure of such projects.
- Assessing the strategic impact of the NMP thematic area in the context of the overall policy objectives of Europe 2020, Innovation Union and the European Research Area (ERA).

Contracts: One contract of 12 months

Timing: First half of 2013

Indicative budget: EUR 300 000

b) Enhancing marketing of Materials Research

Subject: Production of boxes/containers containing a few objects showing materials research progress over the last few years and their potential, together with a succinct explanation of why the materials behave like they do. The boxes/containers should follow or improve the concept of the Secret Material Boxes, include hands-on experiments, and address a young or lay public.⁸⁰

Contracts: One contract of maximum 8 months

Timing: Upon approval of this work programme

Indicative budget: EUR 220 000

⁸⁰ See http://ec.europa.eu/research/industrial_technologies/promotional-material_en.html

V. INDICATIVE BUDGET

V.1 NMP Theme - INDICATIVE BUDGET in EUR million⁸¹

7 th NMP calls		2013 ⁸²
	Call FP7-NMP-2013-LARGE-7	158.00
	Call FP7-NMP-2013-SMALL-7	82.00
	Call FP7-NMP-2013-SME-7	39.30
	Call FP7-NMP-2013-CSA-7	13.90
	Call FP7-OCEAN-2013 ⁸³	7.00
	Call FP7-NMP-2013-EU-China (Coordinated call EU-China)	5.00
	Call FP7-NMP-2013-EU-Japan (Coordinated call EU-Japan)	5.00
	Call FP7-ERANET-2013-RTD ⁸⁴	1.50
	Sub-total (NMP topics)	311.70
Public-Private Partnerships (PPPs) calls	Factories of the Future	160.00
	Energy-efficient Buildings	110.00
	Green cars	20.00
	Sub-total (PPP topics)	290.00
Total estimated budget		601.70
General activities (cf Annex 4 – details below)		5.38
Other activities	- <i>Evaluation, monitoring and reviews</i> (2.50) - <i>PTA (Project Technical Assistants)</i> (2.20) - <i>Procurements (ESIC, studies)</i> (3.52)	8.22
Estimated total budget		615.30

⁸¹ The Budget figures given in this table are rounded to two decimals points

⁸² Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

⁸³ "The Ocean of Tomorrow 2013" call fiche with all relevant information can be found in the Work programme of Theme 2 " Food, Agriculture, Fisheries and Biotechnology" (FAFB)

⁸⁴ The ERA-NET call fiche is in Annex 4 of the Cooperation work programme

		2013 ⁸⁵
General Activities (see Annex 4)	- <i>Cordis (0.84)</i> - <i>Cost (4.49)</i> - <i>Eureka (0.04)</i> - <i>Experts/evaluators/reviewers (0.01)</i>	5.38

All budgetary figures given in this work programme are indicative. The final budgets awarded to actions implemented through calls for proposals may vary by up to 10% of the total value of the indicated budget for each call.

For actions not implemented through calls for proposals:

- The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions;
- The final budget awarded for all other actions not implemented through calls for proposals may vary by up to 10% of the indicated budget for these actions.

⁸⁵ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

WORK PROGRAMME 2013

COOPERATION

THEME 5

ENERGY

(European Commission C(2012)4536 of 09 July 2012)

ANNUAL WORK PROGRAMME 2013

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ANNUAL WORK PROGRAMME

2013 COOPERATION THEME 5: ENERGY

Overall objective of the FP7 Energy Theme:

Adapting the current energy system into a more sustainable one, less dependent on imported fuels and based on a diverse mix of energy sources, in particular renewables, energy carriers and non polluting sources; enhancing energy efficiency, including by rationalising use and storage of energy; addressing the pressing challenges of security of supply and climate change, whilst increasing the competitiveness of Europe's industries.

I. CONTEXT

I.1. Political landscape

Against the backdrop of the current economic situation and increased global competition, the Union has defined a strategy to support growth and job creation, Europe 2020. The Innovation Union Flagship initiative supports this strategy through specific commitments. Research and innovation are key drivers of competitiveness, jobs, sustainable growth and social progress.

The work programme 2013 aligns with, and contributes towards, the objectives of Europe 2020, the Innovation Union Flagship, the EU's Energy and Climate policies, including the Energy Roadmap 2050, as well as other EU policies. There is a determined focus on fostering new ideas, supporting world class teams to generate solutions to address the Energy societal challenges, and on ensuring that the fruits of our investments can be properly exploited in Europe and be the basis for a global industrial leadership.

In this way the work programme provides for a smooth transition towards the new research and innovation programme for 2014-2020, Horizon 2020.

I.2. Approach for 2013

A technological shift in the EU's current energy system is necessary to achieve the 2020 targets and realise the 2050 ambitions to largely decarbonise energy and transport sectors. There is an urgent need of bringing new, high performance technologies to the market and to ensure the European leadership on low carbon energy technologies. The scale of investment, the high demand for cutting-edge research capacities and the global nature of technology markets require a European approach to energy research and innovation.

Activities in this work programme contribute to **supporting European Energy and Climate Policy initiatives**, the **implementation of the SET-Plan** – its Industrial Initiatives as well as its Research and Innovation agenda – while completing the portfolio of FP7 activities and **bridging to Horizon 2020**, the next EU Research and Innovation Framework Programme.

A major novelty of this work programme is the special emphasis on a cross-cutting approach in support of the new European Innovation Partnership on Smart Cities and Communities:

- **Smart cities and communities:** Smart Cities and Communities integrate energy, transport and ICT solutions to increase energy efficiency in urban environments. The goal

is also to create new markets for the industry and to provide new or enhanced services to the end users and the citizens. In line with the proposal for an energy efficient Directive¹ and with the forthcoming Commission Communication on Smart Cities and Communities, activities of this work programme target industry-led large-scale demonstration of integrated, innovative and replicable solutions for more efficient buildings, electricity distribution grids and heating/cooling systems (Area 8.8). These activities are complemented by research on distribution grids and electric vehicles (topics 7.1.1, 7.3.1 and 7.3.2). Replication of successful solutions will ensure a high impact. These activities contribute to the SET-Plan Initiative on Smart Cities and Communities, which is also supported in other parts of the FP7 work programme 2013, notably by the ICT, Transport and NMP Theme.

In addition, this work programme will continue to support the following three priority areas:

- **Renewable energy sources:** The EU shall reach a share of 20% of renewable energy in its final energy consumption by 2020². In support of the EU's energy and transport policy targets and in line with the forthcoming Renewable energy strategy, this work programme aims at increasing the competitiveness of a portfolio of renewable energy technologies for electricity generation (Activity 2 and 10), fuels (Activity 3 and 10) and for application in the heating/cooling sector (Activity 4). The priorities for solar energy, wind and bio-energy are in support of the SET-Plan Industrial Initiative's roadmaps and implementation plans which identify the key RD&D challenges for delivering cheaper and more efficient technologies and have been agreed by industry, Commission and Member States.
- **Smart grids and energy storage:** The integration of decentralised renewable energy sources and the completion of the internal energy market require more flexible and "smarter" electricity grids with appropriate storage options. Taking into account the Energy Infrastructure package³ as well as the forthcoming Commission Communication on the internal energy market, actions in Activity 2 (topic 2.7.1), Activity 7 and Activity 10 aim at increasing the efficiency, flexibility, safety, reliability and quality of the European electricity systems and networks within the context of a more integrated European energy market. Priorities in these areas are in support of the roadmap of the SET-Plan Industrial Initiative on Electricity Grids.
- **Carbon Capture and Storage (CCS):** Capturing and storing CO₂ is an important option for drastically reducing the adverse environmental impact of fossil fuel use on a European and global scale. Taking into account the forthcoming Commission Communication on CCS, actions in Activities 5 aim at increasing the efficiency of capture technologies and the reliability of geological CO₂ storage, while actions in Activity 6 target reducing CO₂ emissions from coal use through research on combining CCS and Underground Coal Gasification. These activities contribute to implementing the roadmap of the SET-Plan Industrial Initiative on CCS.

Finally, this work programme also contributes to the following cross-thematic **priorities**, whose centre of gravity lies on other programmes:

- **Oceans of the future:**
 - OCEAN 2013.4 Innovative transport and deployment systems for the offshore wind energy sector

¹ COM/2011/0370 final

² Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources

³ COM/2011/0658 final

- **Raw materials** - the following topic addresses related issues relevant to this priority:
 - Support to integrated research programmes between research performers on innovative research in support of the SET Plan Research and Innovation Agenda
- **Bio-resource efficiency** – the following topics address related issues relevant to this priority:
 - Topic ENERGY.2013.3.2.1: Pre-commercial industrial scale demonstration plant on paraffinic biofuels for use in aviation
 - Topic ENERGY.2013.3.7.1: Developing regional and pan-European schemes for the sustainable delivery of non-food biomass feedstock in a pan-European integrated market
 - Topic ENERGY.2013.10.1.1: ERA-NET Plus – Bioenergy: Demonstrations of the European Industrial Bioenergy Initiative.

a) Innovation dimension of the activities

In line with the objectives of the "Innovation Union", this work programme strengthens the whole chain of research and innovation, from high risk / high impact frontier research to pre-commercial demonstration in order to accelerate the market uptake. The following innovation measures are in support of activities closer to market such as:

- Support to market-uptake, notably through more activities aimed at generating knowledge to deliver new and more innovative products, processes and services. This includes activities such as prototyping, testing, demonstrating, and knowledge transfer. See in particular (not exhaustive list)
 - Topic ENERGY.2013.8.8.1: Demonstration of optimised energy systems for high performance-energy districts
 - Topic ENERGY.2013.3.2.1: Pre-commercial industrial scale demonstration plant on paraffinic biofuels for use in aviation
 - Topic ENERGY.2013.7.2.3: Large-scale demonstration of innovative transmission system integration and operation solutions for (inter)connecting renewable electricity production
 - Topic ENERGY.2013.5.1.1: Scale-up of advanced high-efficiency capture processes
- Industrial leadership is mandatory in all projects with a predominant demonstration component, in order to accelerate the market roll-out of low-carbon technologies, and encouraged in significant number of additional topics.
- Innovation is also encouraged by supporting demand-side measures such as standard-setting. See in particular:
 - Topic ENERGY.2013.7.2.3: Large-scale demonstration of innovative transmission system integration and operation solutions for (inter)connecting renewable electricity production
 - Topic ENERGY.2013.7.3.2: Enhanced interoperability and conformance testing methods and tools for interaction between grid infrastructure and electric vehicles
- User engagement is encouraged particularly in all projects which have a direct impact on the daily life of European citizens, such as Smart Cities and Smart Grids.

The focus on innovation and EU industrial plans is reflected in the description of the objectives and scope of the specific topics, as well as in the expected impact statements. The innovation dimension of the proposals will be evaluated under the 'Impact' evaluation criterion.

b) Bridging towards Horizon 2020:

This work programme is the bridge between the closing of FP7 and the forthcoming 'Horizon 2020'. In the spirit of the intervention logic of Horizon 2020 and in line with the conclusions of the European Council from 4 February 2011⁴, this work programme (in particular area 10.1) aims at **reinforcing cooperation with and among Member States** to implement the SET-Plan through joint actions, for example

- Topic ENERGY.2013.10.1.1: ERA-NET Plus – Bioenergy: Demonstrations of the European Industrial Bioenergy Initiative
- Topic ENERGY.2013.10.1.3: Supporting the coordination of national research activities of Member States and Associated States in the field of OCEAN energy (ERA-NET)
- Topic ENERGY.2013.10.1.2: ERA-NET Plus – European wind resources assessment.

In addition, the work programme supports the **integration of research programmes** in order to increase European coherence among national research operators through the pooling of research capacities, see in particular

- ENERGY.2013.10.1.5: Integrated research programme in the field of photovoltaics;
- ENERGY.2013.10.1.6: Integrated research programme in the field of wind energy;
- ENERGY.2013.10.1.7: Integrated research programme in the field of bioenergy;
- ENERGY.2013.10.1.8: Integrated research programme on smart grids;
- ENERGY.2013.10.1.9: Integrated research programme on electrochemical storage;
- ENERGY.2013.10.1.10: Integrated research programme on Concentrated Solar Power.

c) SME relevant research

Participation of SMEs has strongly been encouraged in the FP7 Energy Theme. Since the start of FP7, almost 20% of participants in the FP7 Energy Theme have been SMEs receiving around 20% of the total budget. The following topics of this work programme encourage explicitly the participation of SMEs:

- ENERGY.2013.5.1.1: Scale-up of advanced high-efficiency capture processes;
- ENERGY.2013.5.1-2: New generation high-efficiency capture processes;
- ENERGY.2013.2.3.2: Small to medium wind turbines;
- ENERGY.2013.4.1.1: Research and development of innovative solar thermal facades.

d) Dissemination actions

The calls are integrated in the **Monitoring and Review Framework of the SET-Plan led by**

⁴ Council conclusion of 4 February 2011; EUCO 2/11 (note 10, 18)

the Commission's Strategic Energy Technologies Information System (SETIS). Each funded project has to comply with and report according to the agreed Key Performance Indicators of the EIIs and agreed Knowledge Sharing Arrangements (including participation to the Energy Research Knowledge Centre under SETIS)⁵. This enhances the dissemination and uptake of results from FP funding. National projects are also invited to join the knowledge sharing scheme to maximise its impact. The Energy Theme continues also its participation in the Open Access Pilot in FP7: project participants are required to deposit peer-reviewed articles resulting from projects to an institutional or subject-based repository, and to make their best efforts to ensure open access to these articles within six months after publication.

e) Overall expected impact

This work programme is expected to impact decisively the implementation of the industry-led European Industrial Initiatives of the SET-Plan by providing EU funding – that will leverage national resources – to tackle their research and demonstration priorities. As a consequence, these activities will boost the development of new energy technologies and their market roll-out for the transition to a low-carbon society.

I.3. International cooperation

All activities are open to researchers and research institutions from third countries and strong efforts are made to encourage them to seize this opportunity. Particular attention is paid to supporting strategic bilateral agreements and dialogues.

In view of the strategic importance of our Southern neighbourhood and in line with the Joint Communication 'A Partnership for Democracy and Shared Prosperity with the Southern Mediterranean', this work programme includes a Specific International Cooperation Action (SICA) on "Research cooperation and knowledge creation in the area of renewable energy in Mediterranean partner countries" (topic ENERGY.2013.2.9.1).

With a view to promoting international cooperation with selected countries, initiatives for collaboration between project(s) under the following topics and suitable project(s) funded by these countries will be encouraged on the basis of mutual benefit and reciprocity:

- Topic ENERGY.2013.5.1-2: New generation high-efficiency capture processes; (with Australia);
- Topic ENERGY.2013.7.3.3: Understanding interfaces in rechargeable batteries and super-capacitors through in situ methods (with industrialized and/or emerging countries).

Cooperation with Third countries or international initiatives is particularly encouraged in the following topics:

- Topic ENERGY.2013.3.7.1: Developing regional and pan-European schemes for the sustainable delivery of non-food biomass feedstock in a pan-European integrated market;
- Topic ENERGY.2013.6.1.1: Combined Underground Coal Gasification and CO₂ Capture and Storage;

⁵ See <http://setis.ec.europa.eu/implementation/eii-key-performance-indicators>

- Topic ENERGY.2013.7.3.2: Enhanced interoperability and conformance testing methods and tools for interaction between grid infrastructure and electric vehicles;
- Topic ENERGY.2013.7.3.3: Understanding interfaces in rechargeable batteries and super-capacitors through in situ methods;
- Topic ENERGY.2013.10.1.2: ERA-NET Plus – European wind resources assessment;
- Support to joint programmes between research performers on innovative research in support of the SET Plan Research and Innovation Agenda.

International cooperation actions may also be part of the Integrated Research Programmes between research performers on innovative research in support of the SET Plan Research and Innovation Agenda supported under Area 10.1.

I.4. Cross Thematic approaches

Under the umbrella of the Smart Cities and Communities initiative this work programme contributes with the following topics to the PPPs on the European Green Cars Initiative and the Energy-efficient Buildings:

- ENERGY.2013.7.3.1 ("Planning rules for linking electric vehicles to distributed energy resources"), and
- ENERGY.2013.7.3.2 ("Enhanced interoperability and conformance testing methods and tools for interaction between grid infrastructure and electric vehicles");
- ENERGY.2013.8.8.1 ("Demonstration of optimised energy systems for high performance-energy districts").

Special attention will be paid to cross-cutting marine and maritime research with the launch of a new cross-thematic call "The Ocean of Tomorrow": joining research forces to meet challenges in ocean management". It will be implemented jointly between Theme 2 "Food, Agriculture and Fisheries, and Biotechnology" (FAFB), Theme 4 "Nanosciences, Nanotechnologies, Materials and new Production Technologies" (NMP); Theme 5 "Energy", Theme 6 "Environment (including climate change)" and Theme 7 "Transport (including Aeronautics)". The main objective of the call is to promote research and innovation on marine technologies, in particular sensors, anti-biofouling materials, and innovative transport and deployment systems for the offshore energy sector. The topics and funding mechanisms will allow for large, multidisciplinary and multi-stakeholder topics with an appropriate balance between (basic/applied) research, knowledge transfer and demonstration, and to support a number of specific EU policies. "The Ocean of Tomorrow" call (FP7-OCEAN-2013) is a cross-thematic call and subject to a separate call fiche.

The following topic is implemented jointly by the ENERGY and FAFB Theme:

- ENERGY.2013.3.7.1: Support to the sustainable delivery of non-food biomass feedstock at pan-European level.

I.5. Socio-economic and gender dimension of research

The socio-economic dimension of energy research is integrated in relevant topics of this work programme, notably in:

- Topic ENERGY.2013.7.2.4: Ensuring stakeholder support for future grid infrastructures;
- Topic ENERGY.2013.9.2.1: European scientific multidisciplinary "think-tank" to support energy policy and to assess the potential impacts of its measures.

Where relevant, account should be taken of possible socio-economic impacts of research, including its intended and unintended consequences and the inherent risks and opportunities. Where appropriate, the projects should ensure engagement of relevant stakeholders and cultivate a multi-disciplinary approach (including, where relevant, researchers from social sciences and humanities). Projects raising ethical or security concerns are also encouraged to pay attention to wider public outreach.

All projects are encouraged to have a balanced participation of women and men in their research activities and to raise awareness on combating gender prejudices and stereotypes. Specific actions to promote gender equality in research can be financed as part of the proposal, as specified in Appendix 7 of the Negotiation Guidance Notes (http://ec.europa.eu/research/participants/portal/ShowDoc/Extensions+Repository/General+Documentation/Guidance+documents+for+FP7/Negotiations+and+amendments/negotiation_en.pdf).

II. CONTENT OF CALLS

This section describes all the topics for which proposals will be called in this work programme. The structure of this section follows the structure of the Specific Programme. For the practical modalities related to the calls, please refer to section III 'Implementation of calls'. For actions not implemented through calls for proposals, please refer to section IV 'Other actions'.

THE CHALLENGE-ORIENTED APPROACH OF THIS WORK PROGRAMME

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II.1. Activity Energy.1: Hydrogen and Fuel Cells

Starting from 2009, the topics in this Activity are defined in the Annual Implementation Plan of the Fuel Cells and Hydrogen Joint Undertaking (FCH JU), established on the basis of Article 187 TFEU (ex-Article 171 TEC). The FCH JU covers fundamental, industrial and applied research as well as demonstration and relevant cross-cutting activities. The detailed programme of activities is decided by its Governing Board. Therefore, such activities are not longer covered within this work programme.

II.2. Activity Energy.2: Renewable Electricity Generation

Research into, development and demonstration of integrated technologies for electricity production from renewables, suited to different regional conditions where sufficient economic and technical potential can be identified, in order to provide the means to raise substantially the share of renewable electricity production in the EU. In order to reach the target of 20% share of renewables in the EU final energy consumption by 2020, research should increase overall conversion efficiency, cost efficiency, significantly drive down the cost of electricity production from indigenous renewable energy resources including biodegradable fraction of waste, enhance process reliability and further reduce the environmental impact and eliminate existing obstacles.

II.2.1. Area Energy.2.1: Photovoltaics

Topic ENERGY.2013.2.1.1: High efficiency c-Si photovoltaics modules

Open in call: FP7-ENERGY-2013-1

Content/scope: Crystalline Si photovoltaics (c-Si PV) is the dominating photovoltaics technology today. Nevertheless, in order to achieve investment costs below 0.7€/W, an intensive and constant R&D support is required. Novel cell architectures and new processes should be developed and transferred as fast as possible into industrial applications.

The proposals shall focus on the scale-up of innovative (laboratory-scale) concepts. Device, process and equipment optimisation to target very high cell and module efficiencies, as well as high production throughput have to be considered at the same time. Proposals therefore shall address the following:

- High performance device concepts: innovative wafer-based silicon devices exploiting new cell architectures and new approaches, such as heterojunctions, rear contact cells, metal wrap through, or other.
- Processing and manufacturing: high-throughput and novel processes for layer deposition, metallization, etc., including the use of lasers, ion implantation and other advanced options; the entire manufacturing process up to module level and therefore also cell handling, interconnection, encapsulation, etc.

Reducing the environmental impact and cost of fabrication, taking into account lifetime and safety issues, and at the same time improving the efficiency of the technology, is a key objective. The proposals shall include a detailed impact analysis of the potential industrial take-up of the new technology developed in terms of production and market parameters. In particular, a cost analysis for a commercial production plant with annual production of 500 MW for the proposed technology must be included.

In order to ensure the industrial relevance and impact of the research efforts, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria 'Implementation' and 'Impact'.

This topic contributes to realising the Implementation Plan (2010-2012) and the Technology Roadmap (2010-2020) of the Solar Europe Industrial Initiative and funded projects will form part of the SEII. In the framework of the EIIs a specific monitoring and knowledge sharing mechanism will be established under the auspices of the Commission and the selected projects will be expected to participate.

Funding Scheme: Collaborative project

Expected impact: (i) Solutions going well beyond the state-of-the-art in terms of investment costs (target below 1 €/W) and efficiency targets at module level $\eta > 21\%$ on mono and $\eta > 19\%$ on multi-Si (ii) Stimulation and acceleration of the industrial take-up of promising results beyond laboratory scale; (iii) New competitive industrial processes.

Additional information: Up to one project may be funded.

Topic ENERGY.2013.2.1.2: Support to key activities of the European Photovoltaics Technology Platform (TP PV)

Open in call: FP7-ENERGY-2013-IRP

Content/scope: The objective of this support action is to provide support to those activities of the European Photovoltaics Technology Platform which are of interest for the photovoltaics community as a whole, and for the general public.

Such activities may include:

- Analysis and follow-up of the technological, regulatory, financial and market context of photovoltaics in Europe and in the World, and providing open information on these issues through reports, factsheets, newsletters, website or other means.
- Dissemination, discussion and/or networking events open to all photovoltaics stakeholders.
- Updating of the TP PV Strategic Research Agenda when necessary, and assessment of its implementation in Europe.
- Coordinating the contribution of the photovoltaics community to the Solar European Industrial Initiative (SEII).

The activities shall take due consideration of the developments of the relevant regulatory framework, in particular the Communication from the European Commission "Renewable energy: a major player in the European energy market"⁶ and its follow-up.

The implementation of these activities shall involve close collaboration with TP PV. However they should aim at involving and serving the photovoltaics community as a whole, including PV TP members, other industry and academia stakeholders, the public sector, and civil society organisations.

Funding scheme: Coordination and support action (supporting action)

Expected Impact: It is expected that an increased cohesion of the photovoltaics sector will be reached through constructive and inclusive debates, and thanks to the availability of scientifically sound, transparent and objective information for all interested parties. Increased communication between research and industry actors will facilitate exploitation of research results and hence the deployment of high-efficient and competitive photovoltaics technologies. Collaboration with the SEII will provide the initiative with adequate input from a wide spectrum of photovoltaics stakeholders, which is expected to facilitate the development and implementation of its different activities on a sound basis.

Additional eligibility criteria: The maximum requested EU contribution per project shall not exceed EUR 500 000.

Additional information: Up to one project may be funded.

⁶ COM(2012) 271 final

See also Area Energy.2.9: Cross-Cutting Issues

II.2.2. Area Energy.2.2: Biomass

No topic is opened in this area.

II.2.3. Area Energy.2.3: Wind

Topic ENERGY.2013.2.3.1: Advanced aerodynamic modelling, design and testing for large rotor blades

Open in call: FP7-ENERGY-2013-1

Contents/scope: The main goal is to develop advanced rotor design models, using integral design tools in order to enable new and optimised designs for the next generation of large-scale wind turbines (up to 20MW). This includes research in aerodynamics, structural response and aerolasticity for full as well as segmented blade concepts.

The research may therefore involve the following areas of work:

- Definition on large-scale rotor blades and aero-tools for turbines to be developed and tested. For upscaling to be successful, a stepwise approach might be needed. Therefore, the project should focus on turbines in the 8 to 12 MW range but may as well pave the way for larger turbines up to 20 MW;
- Development of advanced aerodynamic modelling for selected elements, including flow devices for distributed aerodynamic control;
- Design and demonstration of new large-scale rotor blades and aero-tools.

Funding scheme: Collaborative Project

Expected impact: It is expected that the results of this research will contribute to making wind energy fully competitive (especially offshore), since larger, more reliable and more efficient rotors and blades have a direct impact on the generation of wind power and therefore on the cost of energy.

This topic contributes to realizing the Implementation Plan (2010-2012) and the Technology Roadmap (2010-2020) of the European Wind Industrial Initiative and the related EERA Joint Programme. The resulting project will form part of the EII.

Additional information: Both industry and R&D community players should be involved in project consortium, in order to ensure the proper industrial implementation of the action at EU level in due time. This aspect will be taken into consideration in the evaluation.

Up to one project may be funded.

In the framework of the EIIs a specific monitoring and knowledge sharing mechanism will be established under the auspices of the Commission and the selected projects will be expected to participate.

Topic ENERGY 2013.2.3.2: Small to medium size wind turbines

Open in call: FP7-ENERGY-2013-1

Contents/scope: The exploitation of wind energy in urban and periurban areas so far has been limited by the moderate wind regime, turbulence, visual impact, vibration and noise, which are all obstacles to the integration of wind turbines in zero energy buildings, high performance energy districts and decentralised power generation systems. This topic therefore is calling for new and innovative solutions to address these issues and improve the exploitation potential of wind energy in urban and periurban areas.

Making use of the recent substantial advances in the technology for large wind turbines, the development of new advanced materials and taking advantage of breakthroughs in other related scientific and technological fields, the projects are expected to substantially improve performance, ease of integration and penetration of small to medium size wind turbines in urban and periurban areas. The projects are expected to deliver low cost, high performance, reliable, durable and safe systems. The research may involve but is not limited to the following areas of work:

- Innovative design, materials and aesthetic solutions;
- New control systems and methods for optimization of operation and maintenance;
- Innovative solutions for transport, assembly and installation thereby minimizing impact in the construction phase.

The new wind turbine system designs shall be validated at pilot scale within the project duration.

Funding scheme: Collaborative Project

Expected impact: It is expected that the results of this research will increase the exploitation potential of wind energy in urban and periurban areas and hence help the wider dissemination of this technology at EU level, whilst also contributing to achieving the EU ambitious goal of a high share of renewable energy in the overall energy mix.

Additional information: R&D community players, energy project developers, industry, urban planners shall be involved in project consortium to ensure swift market implementation of the developed innovative systems. Participation of SMEs is particularly encouraged.

Up to one project may be funded.

See also Area Energy.10.2 Other Horizontal Actions: Topic OCEAN 2013.4 Innovative transport and deployment systems for the offshore wind energy sector

II.2.4. Area Energy.2.4: Geothermal

Topic ENERGY.2013.2.4.1: Exploration and assessment of geothermal reservoirs

Open in call: FP7-ENERGY-2013-1

Content /Scope: The aim of this research is to develop reliable exploration methods for geothermal reservoirs. It will embrace geophysical, geological and geochemical knowledge through an interdisciplinary approach.

The project will investigate all accessible information from resource location, structural geology and estimation of the in-situ stresses, to geophysical and geochemical data. The potential of supercritical fluids should also be explored.

Methods to acquire and validate the information should be applied at promising sites. This should involve laboratory and downhole measurements in order to characterise different in-situ properties of reservoir rocks or aquifers and be validated through downhole measurements.

The development of a common and EU-wide accepted standardized protocol for characterization of geothermal potential will help to set up a clear and transparent European database.

The final result should be scientifically sound methods to assess the technical potential and physical properties of geothermal reservoirs prior to drilling and utilisation, including appropriate software development and a clear definition of process indicators.

Funding scheme: Collaborative Project

Expected Impact: Europe and the EU programmes in particular have invested successfully in EGS in the last years and now European industry has unique record of industrial exploitation of this technology. It is known that many sites in Europe are suitable for further development of geothermal energy. However, besides the issues of public acceptance, which could suitably be addressed by the recently established ERA-NET Geothermal Energy, main bottlenecks for a more widespread use of geothermal energy are the high initial investment costs and the uncertainty of exploitation of the geothermal reservoir. It is expected therefore that the developed reliable science based exploration and assessment methods for geothermal reservoirs under this topic would address this latter bottleneck and significantly enhance the potential of geothermal energy in the energy mix while also strengthening the leading role of the European Union in geothermal energy.

Additional information: Up to one project may be funded.

II.2.5. Area Energy.2.5: Concentrated Solar Power

No topics are opened in this area.

See Area Energy.2.9: Cross-Cutting Issues.

II.2.6. Area Energy.2.6: Ocean

Topic ENERGY.2013.2.6.1: Design tools, enabling technologies and underpinning research to facilitate ocean energy converter arrays

Open in call: FP7-ENERGY-2013-1

Content/Scope: For many years, different individual (wave and tidal/current) ocean energy devices have been individually supported by the EU programmes. Recently, some have been connected to the grid to produce electricity. An important next stage to exploit the ocean energy potential is to install several identical devices within an array like done in wind farms to raise their overall electricity production. However, the way the ocean energy devices will

perform, as well as their economic viability, is critically linked to their design, to a comprehensive understanding of the interactions which take place at this level, and to the development of necessary enabling technologies.

The objective of the research is therefore to develop optimal designs, enabling technologies and underpinning research to facilitate the development of ocean energy converter arrays. Research and development are needed at all levels, from moorings and foundations, operation and maintenance, power take off and electrical systems development, through to array and control system modelling and environmental impacts. The solutions developed should be applicable to as many devices and under as many different site conditions as possible. Solutions should be validated / trialled using existing installations, single devices or test centres.

Funding scheme: Collaborative Project

Expected impact: The optimisation of the design, development and operation of ocean energy arrays will contribute to the efficient and sustainable use of the ocean energy resource and hence to a better cost competitiveness, which will pave the way to a large-scale deployment of ocean energy systems. This deployment would bring a strong balancing effect to offshore wind electricity production due to its easier predictability and a dephasing effect, leading to a valuable complementary impact on power quality and value.

Additional information: Links with the wind offshore activities should be brought in to take advantage of the accumulated knowledge with establishment of offshore wind farms.

Up to one project may be funded.

II.2.7. Area Energy.2.7: Hydro

Topic ENERGY.2013.2.7.1: Optimisation of water turbines for integration of renewables into the grid

Open in call: FP7-ENERGY-2013-1

Content/Scope: The activities under this topic will focus on research and development to optimise water turbines for storage (as well as conventional) applications in energy systems incorporating a large share of intermittent renewable energy, encompassing both fresh and sea water environments. One particular problem in accommodating renewables in these systems is to cope with frequent and large load changes, fatigue loads and significant water level variations. The proposals shall involve modelling, hydraulic and mechanical design, new material use and fabrication techniques, model validation and prototype testing.

The aims are to significantly increase turbines efficiency, operating range, life time and unit response, while also extending the use of hydro storage in seawater environments.

The prototypes developed shall be tested in real conditions during the lifetime of the project.

Funding Scheme: Collaborative Project

Expected impact: The highly efficient turbines resulting from this project with larger operating ranges and faster unit response will increase the efficiency, potential and range of application (including in seawater environment) of hydro power storage (and generation) and hence help increasing the share of renewable energies into the grid.

Additional information: The active participation of the R&D community, industrial partners

and technology suppliers, as well as of grid operators and energy project developers is essential to form a multidisciplinary consortium able to test in real conditions, promote project results and hence ensure swift market implementation of the developed innovations. This will be considered during the evaluation under the 'Implementation' criterion.

Proposals should include a clear plan for the exploitation of the scientific and technical results at European level. This will be considered during the evaluation under the 'Impact' criterion.

Up to one project may be funded.

II.2.8. Area Energy.2.8: Innovative Integration of Renewable Energy Supply and Energy Efficiency in Large Buildings and/or Concerto Communities

No topic is opened in this area.

II.2.9. Area Energy.2.9: Cross-Cutting Issues

Topic ENERGY.2013.2.9.1: Research cooperation and knowledge creation in the area of renewable energy with Mediterranean partner countries

Open in call: FP7-ENERGY-2013-1

Content/scope: The Mediterranean Partner Countries (MPC) possess a vast potential of renewable energy resources. However, their research and development capacities to make most of this potential for both domestic use and export need strengthening. At the same time, European research centres would benefit from the possibility to test and validate new technologies in real conditions. One way to support both aims is to promote exchange of researchers, training through research and knowledge sharing. However, for this to be fully beneficial to MPC, such action should be coupled with capacity building and research infrastructure development in the MPC.

Therefore, this topic aims to support cooperation on research and innovation in the area of renewable energy between European research centres and research organisations in the MPC. Such cooperation would *a priori* involve a first period of joint research and development work in one or more European organisations, a second period of joint testing and validation in one or more research organisations in MPC and a third period of establishing a roadmap for further cooperation on RTD&D, technology transfer, technology deployment and research infrastructure development in the targeted areas. A balanced participation of both junior and senior researchers, the different relevant institutions and other key stakeholders from both regions will be a prerequisite for the grant. Ideally each individual project will cover at least 3 out of the following 6 renewable energy areas: photovoltaics, concentrated solar power, solar-thermal, wind, bioenergy, grid integration.

Funding scheme: Collaborative Project for specific cooperation actions (SICA) dedicated to Mediterranean partner countries

Expected impact: The resulting projects are expected to substantially and sustainably increase the research and development capacity in the participating regions, to help establish sustainable cooperation networks amongst partner countries, to foster MPC participation in EU programmes, and to pave the way for long-lasting cooperation in renewable technologies and R&D more generally between the MPC and between them and Europe and thus also

contributing to achieving the aims of the European external energy policy⁷.

Additional information: Up to 2 projects may be supported for a total period of implementation per project of 4 years, each one involving necessarily a balanced effort in terms of manpower, R&D responsibilities and renewable energy deployment objectives between the EU and MPC partners. This will be considered during the evaluation under the 'Implementation' criterion.

Topic ENERGY.2013.2.9.2: Methods for the estimation of the Direct Normal Irradiation (DNI)

Open in call: FP7-ENERGY-2013-1

Contents/scope: Concentrating solar technologies need reliable estimates of the Direct Normal Irradiation (DNI). For example, Concentrated Solar Power (CSP) plants need forecasts for short term (45 - 240 minutes) and very short term (1 - 45 minutes) time horizons. The objective of the topic is to support the development and validation of a method for the estimation of the DNI. The method developed will have to provide estimates at a spatial and temporal scale which is relevant to the needs of CSP in the first place and possibly also for Concentrated Photovoltaics (CPV) and other applications. Besides cloudiness, the method will have to take into account the other factors which can affect the DNI (e.g. aerosols).

The method shall be validated against ground measurement data.

Funding scheme: Collaborative Project

Expected impact: Current methods provide estimates with errors of $\pm 15\%$. The method developed should provide more reliable forecasts of the DNI, thus reducing the uncertainties affecting (i) the prefeasibility studies of new CSP plants and possible new CPV installations, and (ii) the electricity production of CSP plants in operation.

Additional eligibility criteria: The maximum requested EU contribution per project shall not exceed EUR 3 million.

Additional information: This action supports the implementation of the Solar European Industrial Initiative of the SET-Plan (SEII), in particular with regard to the optimization of operation of CSP plants and CPV installations. In the framework of the EIIs a specific monitoring and knowledge sharing mechanism will be established under the auspices of the Commission and the selected projects will be expected to participate.

Up to one project may be funded.

⁷ COM(2011) 539 final: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on security of energy supply and international cooperation - "The EU Energy Policy: Engaging with Partners beyond Our Borders"

II.3. Activity Energy.3: Renewable Fuel Production

This activity encompasses research activities into, development and demonstration of improved fuel production systems and conversion technologies for the sustainable production and supply chains of solid, liquid and gaseous fuels from biomass (incl. biodegradable fraction of waste). Emphasis should be on new types of Biofuels in particular for transport and electricity as well as on new production, storage and distribution routes for existing Biofuels, including the integrated production of energy and other added-value products through biorefineries. Aiming to deliver 'source to user' carbon benefits, research will focus on improving energy efficiency, enhancing technology integration and use of feedstock.

II.3.1. Area Energy.3.1: First Generation Biofuel from Biomass

No topic is opened in this area.

II.3.2. Area Energy.3.2: Second Generation Fuel from Biomass

Topic ENERGY.2013.3.2.1: Pre-commercial industrial scale demonstration plant on paraffinic biofuels for use in aviation

Open in call: FP7-ENERGY-2013-2

Contents/scope: The aim is to support the construction of pre-commercial plant(s) on paraffinic biofuels based on sustainable biomass feedstock (such as those defined in article 21.2 of the Renewable Energy Directive⁸ as well as algae). The call aims at industrially led projects with large-scale installed production capacity (ideally in the range of several thousand tons per year). The biofuel production plants should be designed to maximise the production of biofuels aimed for use in the aviation sector. The proposals should address the complete value chain including the supply chain of the sustainable biomass resource and the use of the biofuel in the aviation market. A detailed Life Cycle Analysis and GHG calculations must be included in the proposal and will be evaluated under the "Scientific and Technological Quality" criterion.

The leading role of relevant industrial partners is essential to achieve the full impact of the projects submitted. Applicants must demonstrate that by the time of the submission of their application (deadline of the call) they have been operating relative demonstration scale plants at a significant production capacity or have such plants under construction with planned commissioning the latest by 31/12/2013 (justification shall be provided in the proposal and will be evaluated under the 'Implementation' criterion). The number of operating hours by the time of the submission of the application (deadline of the call) may be an asset for the applicant.

Funding scheme: Collaborative Projects with a predominant demonstration component

Expected impact: The construction of such pre-commercial plants will accelerate the deployment of paraffinic biofuel technologies aiming to facilitate achieving the EU Biofuel FlightPath and the biofuels targets of the Renewable Energy Directive. Furthermore it will

⁸ Biofuels from waste, residues, non-food cellulosic material and ligno cellulosic material

provide reasonable basis for ensuring the reliable supply of sustainable biomass resources to the plants and it will be the first step towards reducing the relative high cost of the new technologies under development.

Additional information: In addition, the proposers must provide additional information by completing Table 1 "Techno-economic Analytical data" and Table 2 "Key Performance Indicators" that have been approved by the TEAM of European Industrial Bioenergy Initiative (EIBI). Tables 1 and 2 as well as information on EIBI are made available through the relevant Guide for Applicants. The elements will be evaluated respectively under the 'Implementation' and 'Impact' evaluation criteria.

Proposals based on hydrogenated vegetable edible oils are not covered by this topic and thus shall be considered out of scope. The topic aims to facilitate the implementation of the SET Plan European Industrial Bioenergy Initiative (EIBI). The European Commission reserves its right to ask the project during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national level.

It is envisaged that up to three projects could be funded.

II.3.3. Area Energy.3.3: Biorefinery

No topic is opened in this area.

II.3.4. Area Energy.3.4: Biofuels from Energy Crops

No topic is opened in this area.

II.3.5. Area Energy.3.5: Alternative Routes to Renewable Fuel Production

No topic is opened in this area.

II.3.6. Area Energy.3.6: Biofuel Use in Transport

No topic is opened in this area.

II.3.7. Area Energy.3.7: Cross-Cutting Issues

Topic ENERGY.2013.3.7.1: Support to the sustainable delivery of non-food biomass feedstock at local, regional and pan-European level

This topic is implemented jointly by the ENERGY and FAFB Theme but only open in call FP7-ENERGY-2013-1

Open in call: FP7-ENERGY-2013-1

Content/scope: In the context of the development of the Bioeconomy, the sustainable and reliable supply of non-food biomass feedstock (i.e. lignocellulosic biomass: agricultural and

forestry residues and energy crops) is a critical success factor for the long-term perspective of biomass-based technologies to produce bioenergy and other bio-based products⁹ on a large scale, while not competing with the food market and also benefiting the local rural communities.

The objectives of this project are to develop Strategies, Roadmaps and Tools (SRT) in support of decision-making at local, regional and Pan-European level. This will involve economic, social, environmental and logistics research building on most relevant data and projects¹⁰.

The development of these SRT will have to confront and make use of a large number of available information including:

- Geographical and environmental (e.g. soil, water, climate, protected areas);
- Agronomical (e.g. best available and identified plant/tree varieties, agricultural and forestry practices including effect of biomass extraction on carbon cycle);
- Industrial (e.g. best available pre-treatment and conversion processes, considering also relevant pilot and demo projects¹¹);
- Logistical (e.g. hubs and transportation routes);
- Economic and regulatory (e.g. CAP, RES Directive, strategies for rural and regional development, national support schemes, workforce).

Due consideration will be given to the development of small-scale plants suitable for decentralized operation with associated benefits to rural communities besides the centralized large-scale units involving long distance biomass transport.

The SRT will be offered to Member States, Associated and neighbouring countries in a sufficient number of regions for testing and validation, including the necessary ex-ante economic, social and environmental impact analysis.

The interaction and possible complementarities between these regional SRT at Pan-European level will be investigated. This could lead to suggest optimal flows of biomass feedstock to all uses and the best possible organisation of biomass pre-treatment and conversion plants at interregional levels.

Ultimately, the most promising logistic supply-chains at local, regional and pan-European levels will be further elaborated into a set of implementation plans. These plans should present notably the infrastructures needed, transport modes and flows of feedstock.

The South East European and East Neighbourhood countries¹² shall be considered as part of this Pan-European approach. Appropriate links will be made with relevant programmes and actions, notably in the context of the EU Agricultural, Environmental, Regional, Enlargement and Neighbourhood policies.

Once validated, most, if not all, SRT material shall be made public in a computerized and easy to use format with an adequate information campaign associated to it in the perspective of possibly developing it as an interactive and updatable reference tool.

Funding scheme: Collaborative Project

⁹ In this context, the term “bio-based product” means a commercial or industrial product (other than food or feed) that is composed, in whole or in significant part, of biological products or renewable domestic agricultural or forestry materials or an intermediate feedstock.

¹⁰ E.g. BEE, CEUBIOM, Biomass futures, Biomap, Biomass Trade Centres, BEn, Wood Heat Solutions, BioEnerGis, CAPRI, etc.

¹¹ E.g. Sector, Bioboost

¹² Bosnia and Herzegovina, Albania, Croatia, Former Yugoslav Republic of Macedonia, Kosovo, Montenegro, Serbia, Turkey, Moldova and Ukraine

Expected impact: It is expected that the SRT developed would usefully support the local, regional and national authorities in their decisions for planning and strategy implementation with regard to the non-food use of biomass feedstock. It shall bring substantial environmental, economic and social benefits as opposed to the current largely individual decision-making by most of the concerned actors. The SRT would also help industries involved in logistics, harvesting, pre-treatment and conversion of biomass for their investment decisions regarding technology, plant location, transport means and industrial operation more generally.

Additional information: Up to one project may be funded which should encompass participation from a sufficient number of countries to ensure Pan-European dimension. This will be considered during the evaluation under the 'Implementation' criterion.

The proposals should clearly identify the links with other relevant projects, how they plan to use synergies and avoid duplication.

The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

Topic ENERGY.2013.3.7.2: Support to key activities of the European Biofuels Technology Platform (EBTP)

Open in call: FP7-ENERGY-2013-IRP

Content/scope: The objective of this support action is to provide support to those activities of the EBTP which are of interest for the biofuel community as a whole, and for the general public.

Such activities may include:

- Analysis and follow-up of the technological, regulatory, financial and market context of biofuels in Europe and in the World, and providing open information on these issues through reports, factsheets, newsletters, website or other means.
- Dissemination, discussion and/or networking events open to all biofuel stakeholders.
- Updating of the EBTP Strategic Research Agenda when necessary, and assessment of its implementation in Europe within the next ten years.
- Coordinating and possibly integrating the contribution of the biofuel community to the European Industrial Bioenergy Initiative (EIBI).

The activities shall take due consideration of the developments of the relevant regulatory framework, in particular the Communication from the European Commission "Renewable energy: a major player in the European energy market"¹³ and its follow up.

The implementation of these activities shall involve close collaboration with EBTP. They should aim at involving and serving the biofuel community as a whole, including EBTP members, other industry and academia stakeholders, the public sector, and civil society organisations.

Funding scheme: Coordination and support action (supporting action)

Expected Impact:

Increased communication between research and industry actors will facilitate exploitation of research results and hence the deployment of advanced, sustainable biofuel technologies all

¹³ COM(2012) 271 final

over Europe. Collaboration with the EIBI will provide the initiative with adequate input from a wide spectrum of biofuel stakeholders, which is expected to facilitate the development and implementation of its different activities on a sound basis.

Additional eligibility criteria: The maximum requested EU contribution per project shall not exceed EUR 500 000.

Additional information: Up to one project may be funded.

II.4. Activity Energy.4: Renewables for Heating and Cooling

Research, development and demonstration of a portfolio of technologies and devices including storage technologies to increase the potential of active and passive heating and cooling from renewable energy sources contribute to sustainable energy. The aim is to achieve substantial cost reductions, increase efficiencies, further reduce environmental impacts and optimise the use of technologies in different regional conditions where sufficient economic and technical potential can be identified. Research and demonstration should include new systems and components for industrial applications (incl. thermal sea water desalination), district and/or dedicated space heating and cooling, building integration and energy storage.

II.4.1. Area Energy.4.1: Low/Medium Temperature Solar Thermal Energy

Topic ENERGY.2013.4.1.1: Research and development of innovative solar thermal facades

Open in call: FP7-ENERGY-2013-1

Content/scope: The topic aims to support applied research, development and validation of new solar thermal facade systems.

The project will develop new and innovative concepts of solar thermal facades which significantly improve the thermal performance of the building envelope (e.g. by means of advanced materials) and which provide a high solar fraction of the heating and cooling requirements (e.g. by means of innovative solar collectors and chillers). The proposed solutions shall offer a considerable contribution to the development of smart energy systems at the city or district level. The design and aesthetics of the proposed solutions shall also be properly evaluated.

The innovative solar thermal facades shall aim at significantly reducing the costs of components, assembly and installation and at also significantly facilitating and decreasing the costs of maintenance and repair.

The proposed solutions shall be validated at pilot scale within the project duration.

Funding scheme: Collaborative Project

Expected impact: The innovative easy-deployable solar thermal facades will contribute to increase the energy efficiency of the building stock and will help achieving the ambitious goals of a high share of renewable energy in the total energy mix.

Additional information: R&D community players, industry, construction companies and architects shall be involved in the project consortium to ensure swift market implementation of the developed innovative systems. Participation of SMEs is particularly encouraged.

Up to one project may be funded.

II.4.2. Area Energy.4.2: Biomass

No topic is opened in this area.

II.4.3. Area Energy.4.3: Geothermal Energy

No topic is opened in this area.

II.4.4. Area Energy.4.4: Innovative Integration of Renewable Energy Supply and Energy Efficiency in Large Buildings and/or Concerto Communities

No topic is opened in this area.

II.4.5. Area Energy.4.5: Cross-Cutting Issues

No topic is opened in this area.

II.5. Activity Energy.5: CO₂ Capture and Storage Technologies for Zero Emission Power Generation

Research, development and demonstration of technologies to drastically reduce the adverse environmental impact of fossil fuel use aiming at highly efficient and cost effective power and/ or steam generation plants with near zero emissions, based on CO₂ capture and storage technologies, in particular underground storage.

II.5.1. Area Energy.5.1: CO₂ Capture

Topic ENERGY.2013.5.1.1: Scale-up of advanced high-efficiency capture processes

Open in call: FP7-ENERGY-2013-1

Content/scope: The objective is the scaling-up of advanced capture technologies that have shown considerable potential for reduction of the energy penalty and a significant overall improvement of cost-efficiency of the whole capture process. Projects can address innovative capture technologies (such as for example solid sorbents, cryogenics and membranes). They should define operating conditions and provide proof of the reliability and cost-effectiveness of these concepts through pilot testing, and aim for an ambitious scale-up as compared to the state-of-the-art. The proposal should state a clearly defined target for the reduction of the energy penalty and the relative incremental operating costs of the capture process, and should assess the environmental impact of the technology at plant scale.

Funding scheme: Collaborative Project

Expected impact: Progress in this area should result in a significant reduction of the energy intensity of the capture process for power plants or other energy-intensive industries, and in a substantial decrease of the cost of capture. The project should prepare the ground for pre-commercial demonstration of the technology. It should actively contribute to the implementation of the Roadmap and Implementation Plan of the CCS Industrial Initiative of the SET-Plan, and, whenever relevant, contribute to the monitoring and knowledge sharing schemes of the Initiative.

Additional eligibility criterion: The requested EU contribution per project shall not exceed EUR 8 Million.

Additional information: The participation of industry and innovative SMEs is particularly encouraged. To realise prototypes or pilots at a meaningful scale, a substantial part of the funding is expected to come from third parties.

The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

Topic ENERGY.2013.5.1.2: New generation high-efficiency capture processes

Open in call: FP7-ENERGY-2013-1

Content/scope: The objective is to support the development of high-potential novel technologies or processes for post- and/or pre-combustion CO₂ capture. Research should follow new paths leading to highly innovative technologies and materials for CO₂ capture

applications with the potential for real breakthroughs. This could include systems based on solids or liquids or a combination of these such as enzyme based systems, bio mimicking systems or advanced solid sorbents and membranes. Environmentally benign technologies should be pursued and their environmental impact addressed in the project also in view of future scaling up. Projects shall provide "proof of concept" through prototype testing. Any research that constitutes a technology demonstration at large scale or a combination of CCS technologies proven at pre-demonstration pilot scale will not be considered for funding.

Funding scheme: Collaborative Project

Expected impact: Progress in this area should result in a significant reduction of the energy penalty of the whole capture process for power plants or other energy-intensive industries, and/or in a substantial decrease of the cost of capture. Projects should actively contribute to the implementation of the Roadmap and Implementation Plan of the CCS Industrial Initiative of the SET-Plan, and, whenever relevant, contribute to the monitoring and knowledge sharing schemes of the Initiative.

Additional Information: With a view to promoting international cooperation with Australia, initiatives for collaboration between project(s) under this topic and selected Australian project(s) will be encouraged on the basis of mutual benefit and reciprocity. The Commission reserves the right to ask the coordinators of FP7 projects, during the contract negotiations, to include collaboration activities (e.g. exchange of information, exchange of researchers) with selected Australian project(s) that are endorsed by the Australian Department for Resources, Energy and Tourism (RET) or the Department of Industry, Innovation, Science, Research and Tertiary Education (IISRTE).

The participation of innovative SMEs is particularly encouraged.

II.5.2. Area Energy.5.2: CO₂ Storage

Topic ENERGY.2013.5.2.1: Mitigation and remediation of leakage from geological storage

Open in call: FP7-ENERGY-2013-1

Content/scope: Geological storage of CO₂ must ensure the safety, reliability and controllability of the storage process, as well as address concerns about leakage of CO₂ - with human health and/or environmental impacts. Safe, long-term geological storage - both onshore and offshore - therefore brings the need for sophisticated methods for the detection, characterisation, mitigation and remediation of leakage from CO₂ storage sites and complexes, as well as for sound approaches to safety assessment.

Mitigation and remediation options should be investigated for a number of different leakage scenarios, addressing for example impaired caprock (dissolution, faults/fractures), well integrity, spillpoint outflow, secondary CO₂ accumulations in shallow aquifers or soils, and eventually surface release. Research should include a thorough analysis of the mechanisms controlling the migration of CO₂ and brine out of the storage target. Results from the project - mitigation and remediation methodologies, safety assessment models shall be published – e.g. as guidelines – so that they could eventually feed into the regulatory process for storage permitting, in particular into the corrective measures plan for storage site operators pursuant to the Directive on geological storage.

Funding scheme: Collaborative Project

Expected impact: Projects should provide a technical knowledge base for the definition of protocols and safety regulations. They should actively contribute to the implementation of the Roadmap and Implementation Plan of the CCS Industrial Initiative of the SET-Plan, and, whenever relevant, contribute to monitoring and knowledge sharing schemes of the Initiative.

Additional information: Inclusion of industrial partners active in CO₂ storage could lead to increased impact of the research to be undertaken. This will be considered during the evaluation under the 'Impact' criterion. The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

II.6. Activity Energy.6: Clean Coal Technologies

Research, development and demonstration of technologies to substantially improve efficiency, reliability and cost of coal (and other solid hydrocarbons) fired power plants. This can also include the production of secondary energy carriers (including hydrogen) and liquid or gaseous fuels. 'Clean coal' in this context really means a sustainable solid hydrocarbon value chain with a focus on efficient and clean coal utilization, i.e. coal use aiming at zero or significantly reduced emissions by means of enhanced plant efficiency and CO₂ capture and storage.

II.6.1. Area Energy.6.1: Conversion Technologies for Zero Emission Power Generation

Topic ENERGY.2013.6.1.1: Combined Underground Coal Gasification and CO₂ Capture and Storage

Open in call: FP7-ENERGY-2013-1

Content/scope: Underground Coal Gasification (UCG) holds potential for reduced CO₂ emissions per unit of gasified coal, for reduced impact from mining operations, and for using the site for CO₂ Capture and Storage (CCS). However, the technology is still in a very early stage of development, and is also controversial because of environmental concerns. The process would be best used at limited depth for easier control, but if the process is not well-managed, UCG could potentially lead to groundwater contamination and/or soil subsidence. The understanding of UCG combined with CCS is limited, and many engineering and environmental challenges still remain. Projects should have a predominant research component, addressing both the environmental and engineering aspects. Emphasis should be on the integrated design, engineering and operation of UCG with reactor zone carbon sequestration, and on the coupled simulation of geomechanical and hydrological effects, including groundwater contamination and surface subsidence. Projects must clearly describe how they will build on and progress the state of the art as presented by previous and ongoing research, and shall aim to establish collaborative links with leading research projects in the field, both in and outside Europe.

Funding scheme: Collaborative Project

Expected impact: UCG with CCS could allow a more sustainable use of coal reserves by reducing the environmental impact of the mining and use of the coal. In addition, it could enhance security of supply of a widely used energy source, as it could allow gaining access to coal reserves that are technically or economically unmineable with present-day technologies, such as for example thin or offshore coal reserves. Bringing together international expertise and experience should result in the identification of best practice and provide clear guidance for possible future actions.

Additional information: An additional aim of this topic is to gain an international perspective. Active participation of non-European partners, in particular South-Africa, Australia, U.S., India and China could add to the scientific and technological excellence of the project and lead to an increased impact of the research to be undertaken. Up to one project may be funded.

II.6.2. Area Energy.6.2: Coal-Based Poly-Generation

No topic is opened in this area.

II.5.&6. Cross-Cutting Actions between Activities Energy.5 and Energy.6

This section includes areas and topics that are cross cutting between 'CO2 capture and storage for zero emission power generation' and 'clean coal technologies', which in many ways are complementary activities.

II.5&6.1. Area Energy.5&6.1: Power Generation Technologies for Integrated Zero Emission Solutions

No topic is opened in this area.

II.5&6.2. Area Energy.5&6.2: Cross Cutting and Regulatory Issues

No topic is opened in this area.

II.7. Activity Energy.7: Smart Energy Networks

To facilitate the transition to a more sustainable energy system, a wide-ranging R&D effort is required to increase the efficiency, flexibility, safety, reliability and quality of the European electricity and gas systems and networks notably within the context of a more integrated European energy market.

II.7.1. Area Energy.7.1: Development of Inter-Active Distribution Energy Networks

Topic ENERGY.2013.7.1.1: Development and validation of methods and tools for network integration of distributed renewable resources

Open in call: FP7-SMARTCITIES-2013

Contents/scope: The aim is to develop and validate methodologies and tools to enable Distribution System Operators (DSOs) to take on new roles and evolve existing roles required by the increased number and volume of distributed energy resources connected to distribution networks. An important new role is observing and balancing of variable renewable generation and loads with decentralized flexible generation, active demand and local storage. It may also require congestion management and the provision of ancillary services. Network operations and grid maintenance will need to be upgraded. Further roles include short- and long-term forecasting and long-term planning. The methods and tools should have a wide applicability in European contexts for both urban and rural areas.

These roles and methods need to be developed in cooperation with Transmission System Operators (TSOs) where responsibilities need to be shared. New methods and tools also need to facilitate new roles of market players and to create a level playing field. For example, in the case of ancillary services, the architecture of an efficient marketplace for ancillary services at the distribution level should be developed, and DSO's should be enabled to provide ancillary services to support TSO operations.

The projects should address resources from small to medium-scale residential, industrial and commercial "prosumers". To further support innovation in business models the projects should take into account contributions from new actors such as aggregators. Validation of the approaches and tools should be performed through simulation and pilot-scale trials. The validation of new methods and tools should build on existing activities in different settings in Europe and form a family of projects. The project results should contribute to the implementation of the European Electricity Grid Initiative (EEGI). The projects should contribute to the monitoring and knowledge sharing schemes of the EEGI.

Projects should include substantial participation of major players such as network operators, power or ICT technology providers, research centres or universities. Projects should include committed participation of distribution operators and also of transmission operators and market players where appropriate. The participation of market players should be consistent with unbundling principles

Funding scheme: Collaborative Project

Expected impact: The projects should contribute to increasing the capacity of medium and low-voltage networks to host renewable and distributed energy resources with a trade-off of grid reinforcement and grid intelligence, without jeopardising quality of service. It should

ensure a cost-effective long-term evolution of electricity networks, while connecting new generation to new loads.

Additional information: Each proposal does not need to cover all the aspects of the entire topic. The projects' results will contribute to the development of smart grids in both rural and urban areas. Exploration of synergies with Smart Cities and Communities will have to be ensured.

II.7.2. Area Energy.7.2: Pan-European Energy Networks

Topic ENERGY.2013.7.2.1: Advanced concepts for reliability assessment of the pan-European transmission network

Open in call: FP7-ENERGY-2013-1

Contents/scope: Today's network reliability is guaranteed by the (n-1) criterion, which assures continuity of the electricity supply in case of loss of a single principal component, without instability or cascading issues. With the massive introduction of renewable energy sources (RES), a continuous but stochastic variation between full production and zero production or load is possible for numerous specific components of the network. As a consequence, the network reliability assessment and subsequent contingency measures need to be fundamentally changed to face the challenges of a complex and multi variable system, where the (n-1) criterion is no longer sufficient.

The aim of this topic is to identify, develop, assess and recommend innovative strategies, methods and tools to evolve current security criteria into more flexible criteria for the future pan-European electricity transmission system while maintaining present-day reliability levels. The new flexible security criteria should consider the substantial anticipated changes in the energy mix for future generation scenarios and recommend ways to allow this transition without jeopardizing current reliability levels. Pilot testing of the proposed concepts in a part of the European electricity network should be included.

The consortium should include a relevant number of TSO's.

Funding scheme: Collaborative Project

Expected impact: With the results of the studies and tests conducted in this topic, Transmission System Operators will be able to propose new security criteria that allow the operation of their networks and particularly cross-border links closer to their physical limits. TSO's will be able to ship growing amounts of renewable energy across the pan-European grid while maintaining or even improving the current high level security of energy supply. While the time to build new lines is usually much longer than the time to build new generation, this will allow a high degree of integration of renewable sources at no expense of security of supply. The results of the studies and the tests conducted in this topic will provide valuable knowledge for broader application at EU level and for strengthening pan-European overall system reliability.

Topic ENERGY.2013.7.2.2: Advanced tools and mechanisms for capacity calculation and congestion management

Open in call: FP7-ENERGY-2013-1

Contents/scope: The aim is to develop new capacity calculation methods for medium- to

long- time horizons (week, month, year, multi-year ahead) and congestion management approaches in accordance with a new comprehensive reliability methodology being developed for the pan-European transmission network. The work should also develop the relevant tools supporting capacity allocation and congestion management.

Stakeholders such as TSO', market operators, regulators and market players have cooperated in establishing the broad lines of a target model for the European Electricity market. Many details and technical issues need to be further developed in particular for capacity allocation and congestion management. They need to take new developments into account in terms of approaches combining preventive and corrective measures for reliability assessment, and the ability to estimate a much more precise state of the system thanks to accurate, synchronised and high-sampling rate measurements.

The consortium should include a relevant number of TSO's.

Funding scheme: Collaborative Project

Expected impact: The results of this project should allow a correct prediction of the available capacity of transmission lines and cross-border interconnections, so that it can be efficiently allocated to market actors. The completion of the internal market creates increasing electricity flows and these are responsible for congestions particularly on cross-border connections. In view of the difficulty of building new lines, it is important to exploit existing connections to the maximum of their physical capacity. Advanced congestion management principles, methods and tools will give correct signals to the market, as to where true physical congestion exists in the network and should thereby minimize the societal loss due to limited network capacity.

Topic ENERGY.2013.7.2.3: Large-scale demonstration of innovative transmission system integration and operation solutions for (inter)connecting renewable electricity production

Open in call: FP7-ENERGY-2013-2

Contents/scope: This topic will primarily address the important technological challenges stemming from the large-scale penetration of renewable electricity production in the European transmission network, in particular the integration and transport of foreseen substantial renewable electricity production (including cross-national generation projects) far from consumption centres (e.g. off-shore wind), possibly in combination with the inter-connection of EU member states' transmission networks to enable increased balancing and trade of electricity. In addition, the operationalisation and integration of storage systems in high voltage networks, as part of the technological solutions to the mentioned challenges as well as in response to the needs of managing the time shift between production and consumption and stabilising the grid, can be addressed.

The projects will propose innovative technological solutions to be implemented on one or several demonstration sites. They should cover at least one, and preferably more, of the following areas:

- Optimised technologies for connecting offshore wind farms to offshore transmission lines (both HVDC / HVAC), which could also interconnect two countries. Solutions to ensure system stability should be addressed, including wind farm and grid control methods and protection schemes and possibly alternative solutions for power collection systems in offshore wind farms.

- New cost-efficient DC technologies (e.g. HVDC VSC, DC breakers, DC/DC converters), including processes for ensuring HVDC grid control and protection;
- Reliable and cost-efficient multi-connector technology for multi-terminal grid solutions, in particular for offshore applications;
- Innovative technologies for new and more powerful interconnection of electricity networks, possibly demonstrating (i) innovative concepts for HV lines (AC and/or DC) and advanced cable technologies; and/or (ii) integration of large-scale storage in (inter-connected) high voltage network with high renewables share, possibly using the balancing opportunities offered by smart system operation.

In view of the replication of the demonstrated solutions and their future commercial exploitation, the technical work in the demonstration projects should be accompanied by activities that propose practical ways to deal with the possible environmental, economic, regulatory, institutional and social constraints and barriers that projects deploying the innovative technologies could face.

These activities should closely liaise with ongoing work on broadening cost-benefit analysis and on cooperation between Member States to streamline regulatory assessment and approval (under proposed Regulation COM(2011)658).

Standardisation and interoperability issues should be addressed, in order to enable multi-vendor compatibility.

The projects should propose Key Performance Indicators to define the objectives of the project (reference and targets).

Funding scheme: Collaborative Project with a predominant demonstration component

Expected impact: The project activities will contribute insights and strategies for securing the EU market for innovative transmission technologies towards 2020 and beyond and will result in policy recommendations. The projects will actively contribute to the technological objectives of the Roadmap and Implementation Plan of the EEGI and activity strand 3 of the European Wind Initiative (wind-grid integration).

Additional information: The leading role of relevant industrial partners is essential to achieve the full impact of the projects submitted, inter alia: TSOs and technology providers (electrical equipment, cable technology, ICT ...) and utilities/renewable electricity producers (especially wind).

The proposals should seek strong synergies with projects of common interest to be identified under the proposed Regulation on trans-European energy infrastructure (COM(2011)658).

Storage systems and technologies should not constitute the main focus of the project proposal and are not expected to represent a major part of the proposal's budget.

The European Commission reserves its right to ask the projects during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national level.

It is envisaged that up to three projects could be funded.

Topic ENERGY.2013.7.2.4: Ensuring stakeholder support for future grid infrastructures

Open in call: FP7-ENERGY-2013-1

Contents/scope: The Project should take a society-oriented path, analysing major stakeholder concerns to the deployment of new or upgraded grid infrastructure and developing approaches

to proactively engage stakeholders in the permitting process. The approach should as far as possible build on transparency, dialog with stakeholders, benefit sharing and other relevant measures. It should be informed by analysis of public concerns in a representative set of Member States. The approach should be supported by the implementation of practical measures to build stakeholder support and be reinforced by replication strategies based on best practice.

The work should take stock and build on relevant experiences of public acceptance of large energy infrastructures, such as wind turbines. It should build on experiences and link with other projects on this topic in Europe, e.g under the Intelligent Energy Europe programme.

Funding scheme: Collaborative Project

Expected impact: The project should contribute to facilitating and accelerating the deployment of new grid infrastructure in the EU by addressing the issue of public acceptance, which is seen as an important show stopper. Projects are expected to contribute to the permit granting and public participation measures expected to be implemented through the proposed regulation on guidelines for trans-European energy infrastructure.

Additional information: The project should contribute to the monitoring and knowledge sharing schemes of the EEGI.

Up to one project may be funded.

II.7.3. Area Energy 7.3: Cross Cutting Issues and Technologies

Topic ENERGY.2013.7.3.1: Planning rules for linking electric vehicles (EV) to distributed energy resources

Open in call: FP7-SMARTCITIES-2013

Contents/scope: The aim is to develop network planning rules and tools to enable electric vehicles in a large scale roll out and to maximise their potential for linking with and balancing of distributed energy resources. The project should provide methods to deal with specific infrastructure characteristics, and local load and congestion issues. Furthermore, it should propose cost effective solutions and investment strategies. The work should take due account of the particular load characteristics and the level of intelligence for a broad range of charging scenarios for electric vehicles. The project should relate to network planning activities from a representative set of distribution networks in Europe and include competence on Low Voltage / Medium Voltage grid simulation and support from automotive manufacturers.

Funding scheme: Collaborative Project

Expected Impact: The project should improve the distribution networks hosting capacity of EV and Distributed Energy Resources (DER). It should enable Distribution System Operators (DSOs) in Europe to do more efficient and more cost effective network planning. Furthermore the project should enable intelligent charging of a variety of EV and promote harmonised conditions in the roll out of charging infrastructure. The project should contribute to the monitoring and knowledge sharing schemes of the SET Plan European Electricity Grid Initiative. Furthermore the project is expected to establish cooperation and to coordinate with relevant projects under NMP, Environment, ICT and Transport to jointly support the EGCI PPP.

Additional information: Up to one project may be funded.

Topic ENERGY.2013.7.3.2: Enhanced interoperability and conformance testing methods and tools for interaction between grid infrastructure and electric vehicles

Open in call: FP7-SMARTCITIES-2013

Contents/scope: The aim is to develop enhanced conformance testing methods and tools for the interaction between grid infrastructure and EVs. It includes development of a proposal for a European smart grid reference system to enable the verification of interoperability through efficient tests. Interoperability requirements should include a broad range of charging modalities, grid stability constraints and consumer needs including high energy supplier flexibility and a pan European market for both new and used EV. The work should be based on draft standards developed under M/453, M/468 and M/490. Developed testing methods should have a high degree of reproducibility and they should be validated through round robin tests and at relevant demonstration sites in the framework of the Smart Cities initiative and/or the European Electricity Grid Initiative. The project is expected to give strong contributions to standardisation working groups. It should furthermore ensure a strong link to international standardization and be open to cooperation with US stakeholders to promote cross certification wherever relevant.

Funding scheme: Collaborative Project

Expected Impact: The project should provide manufacturers of EV and EV infrastructure with cost effective conformance testing methods and tools for their products interaction with the European electricity network. Furthermore it should enable consumers to verify their expectations to pan-European interoperability of charging services. The project should contribute to the monitoring and knowledge sharing schemes of the SET Plan European Electricity Grid Initiative. Furthermore the project is expected to establish cooperation and to coordinate with relevant projects under NMP, Environment, ICT and Transport to jointly support the EGCI PPP.

Additional information: Up to one project may be funded.

Topic ENERGY.2013.7.3.3: Understanding interfaces in rechargeable batteries and super-capacitors through in situ methods

Open in call: FP7-ENERGY-2013-1

Content/scope: The understanding and control of interfaces in rechargeable batteries and super-capacitors is essential to ensure good electronic and ionic transport across them. The term "interface" does not only refer to solid electrode/liquid electrolyte interface but also to buried interfaces (e.g. between additives and active material, the solid electrolyte interphase, and between lithiated and delithiated phases (in lithium ion batteries), etc. The physical and chemical processes occurring at these interfaces determine performance in terms of kinetics (charge-discharge rates) as well as safety and understanding their reactivity is a key tool in understanding capacity fade and failure modes. Being able to monitor changes in real time and to follow uncontrolled reactions leading to high impedance, safety issues and reduced energy and power output is of particular importance to control interfacial processes.

Research should target the investigation of interfaces over broad time and length scale through in situ methods and multi-technique probes, so as to correlate surface structure with its reactivity. The use of computational modelling tools is encouraged in order to

complement molecular-level understanding of interfaces and help in designing high quality interfaces for batteries and supercapacitors with enhanced performance. The development and applications of methods to study interfacial issues of relevance to large (grid-scale) batteries or long term stability should be addressed by the project.

Funding scheme: Collaborative Project

Expected impact: The results should contribute to building the fundamental basis for the next generation of electrical energy storage devices.

Additional information: This pre-competitive topic has been developed based on the results of workshops organized by the Commission in collaboration with the US. The inclusion of top class research groups from industrialised and/or emerging countries is encouraged. In addition the proposal should allocate resources for 1-2 workshops aiming at exchange of information on the basis of mutual benefit and reciprocity with selected on-going projects in 3rd countries. Such projects may be identified by the Commission during the negotiation phase.

II.8. Activity Energy.8: Energy Efficiency and Savings

The vast potential for final and primary energy consumption savings and improvements in energy efficiency need to be harnessed through the research into, optimisation, validation and demonstration of new concepts, optimisation of proved and new concepts and technologies for buildings, transport, services, and industry. Large-scale actions may be supported by innovative R&D addressing specific components or technologies. A key aim is the optimisation of the local community energy system, balancing a significant reduction in energy demand with the most affordable and sustainable supply solution, including the use of new fuels in dedicated fleets.

II.8.1. Area Energy.8.1: Efficient Energy Use in the Manufacturing Industry and Building Sector

No topics are opened in this area.

II.8.2. Area Energy.8.2: High Efficiency Poly-Generation

No topics are opened in this area.

II.8.3. Area Energy.8.3: Large-Scale Integration of Renewable Energy Supply and Energy Efficiency in Buildings: ECO-BUILDINGS

No topics are opened in this area.

II.8.4. Area Energy.8.4: Innovative Integration of Renewable Energy Supply and Energy Efficiency in Large Communities: CONCERTO

No topics are opened in this area.

II.8.5. Area Energy.8.5: Innovative Strategies for Clean Urban Transport: CIVITAS-PLUS

No topics are opened in this area.

II.8.6. Area Energy.8.6: Socio-Economic Research and Innovation

No topics are opened in this area.

II.8.7. Area Energy.8.7: Thematic Promotion and Dissemination

No topics are opened in this area.

II.8.8. Area Energy.8.8: Smart Cities and Communities

Urban communities often share residential, public or commercial spaces that lend themselves to the early adoption of innovative technologies that can dramatically **reduce energy consumption**. Smart cities and communities are planning and acting for a more sustainable future characterised by investments in innovative, integrated technologies and services such as heating, mobility, lighting, broadband communications and other utilities. They are developing and implementing, at district or corridor level or larger, intelligent solutions, enabled by ICT and the mobilisation of their social, industrial and environmental capital, that will empower citizens and coordinate the delivery of more efficient, integrated and enhanced energy and transport services for their inhabitants.

In this context, the Commission wishes to support a greater level of integration of topics that relate to Smart Cities and Communities in the energy, transport and ICT areas. Thus, projects – which are few in number and large in scale - supported under this area will have a high level of ambition in terms of integrated technology demonstration. It is envisaged that this approach will be continued and extended in future calls, providing a coherent set of activities from technology development to demonstration and ultimately laying the foundations for commercial roll-out via horizontal actions and market measures. This area of the Work Programme therefore encompasses energy-related topics such as energy efficiency, energy (electricity, heating and cooling) networks, and renewable energy production and urban planning. Innovative solutions are sought at the interfaces of these challenges as well as with other urban issues in the areas of ICT and transport.

Cross-sector Industry-led consortia are invited to take the lead in close collaboration with cities to devise innovative measures that accelerate the deployment of low carbon technologies. In each project, the cross-sector industry-led consortium drawn from three Member States and/or Associated Countries is expected to team up with ideally one or two cities to enhance the replication potential of the measures, to ensure their EU-wide impact and to facilitate the exchange of knowledge. Financial support will be given to measures that would help cities to substantially reduce greenhouse gas emissions in an innovative and integrative manner and represent a high replication potential.

Projects supported under this area will contribute to the Energy-efficient Buildings Public-Private-Partnership and are part of the Smart Cities and Communities coordinated call between the Energy and ICT Themes (FP7-SMARTCITIES-2013). For example, the topic under this area is complementary to the topic "Optimising Energy Systems in Smart Cities of ICT theme" in which the focus is on demonstrating the integration of renewable energy sources into electricity grids (including through the use of power electronics) and optimisation of heating and cooling systems for high performance energy efficient buildings.

Topic ENERGY.2013.8.8.1: Demonstration of optimised energy systems for high performance-energy districts

Open in call: FP7-SMARTCITIES-2013

Contents/scope: The objective of this topic is to demonstrate, at the level of cities or districts, an innovative integrated energy system, optimised both in terms of increase in energy efficiency and CO₂ reduction.

This objective may be achieved with a balance of supply-side measures based on a high share of renewables and demand-side measures to reduce consumption. Although the balance shall be optimised for each city, it should lead to a good business case for replication.

The proposals should address all of the following three aspects through a credible and coherent integrated approach.

1. **Retrofitting of a district towards zero energy buildings.** The proposed measures should aim to demonstrate innovative technical, economic and financial solutions which significantly increase overall energy efficiency. All types of buildings can be addressed, with a focus on residential buildings. All elements and systems of the buildings that could in a life-cycle perspective (thus including embedded energy) contribute to a better energy efficiency and sustainability through integrated design and planning should be envisaged, the measures shall be chosen based on a sound assessment of the social, economic and environmental performances of the different technology options. The detailed metering/monitoring programme should last at least for one full year, however, longer term commitment and programmes of the building operators (e.g. in continuous monitoring and/or guarantees of performance to the tenants) would give an added value to the proposal. The monitoring programme should include behavioural aspects (see additional information on the next page).
2. **Proposing innovative solutions for the medium and low voltage electricity distribution grid,** with the objective to improve the integration of a large share of power generated from renewable energy sources (for example photovoltaic installations) with the power supplied a conventional centralised installation (for example a Combined Heat and Power plant), and to increase energy efficiency of the distribution grid by implementing smart solutions and new efficient network components. In case of photovoltaic installations, the integration in the built environment of standardised PV building components requires both electric and architectural optimization, combining electricity production with substantial ICT part. Proposals should also consider electricity storage devices and strategies to better match supply with demand, optimise district and single building storage approaches, and provide ancillary services for the grid quality. In addition, proposals can cover technological and economic assessment of the integration of electric vehicles into the local grid, with intelligent charging/discharging systems and assessment of the best balance of stationary versus mobile storage.
3. **Proposing innovative solutions for district heating and cooling energy supply,** with the objective of improving the overall efficiency of the system (heat generation, distribution and final use). The applicants should propose district heating and/or cooling systems based primarily on recovering waste heat and adapting the temperature levels of the grid to the applications. Additional energy sources might include a significant share of local renewable energy sources supply. In doing so, the proposals could envisage links with industrial parks. The proposals should consider innovative applications for hot water, such as white goods supply. It should also make the best use of heat or cold storage devices or systems. Both short term and long term storage systems can be envisaged.

The activities proposed by the applicants should be based on a convincing city and mobility planning exercise with special consideration of innovative energy technology integration and participation of all relevant actors, completed at an earlier stage. Costs related to this planning exercise are not in the scope of this topic. All proposals should present a sound business model of all measures envisaged to be carried out in the project. This model should pay particular attention to assess economics and benefits for industry and the customers and end-users. The proposals will be asked to report performance data into existing horizontal activities for good-practice sharing, such as CONCERTO and the Smart Cities Stakeholder Platform. Thus, they should allocate appropriate resources for comprehensive reporting and innovative dissemination measures.

Expected Impact: In addition to the impacts outlined for this Area in general, successful projects should set-up clusters of cities, and partnerships between cities and industries. Through integrated actions, projects should demonstrate their viability as new innovative market solutions and show a high replication potential for large-scale market deployment before 2020. An ambitious dissemination and market deployment plan should be included in the proposal. The credibility of this plan will form part of the evaluation.

Funding scheme: Collaborative Project with a predominant demonstration component

Additional eligibility criterion: The maximum requested EU contribution per project must not exceed EUR 30 million.

Additional information: The grant will always be composed of a combination of: the typical reimbursement of eligible costs, and flat rate financing determined on the basis of scale of unit costs only for the building-related demonstration activities part of the buildings.

This action supports the implementation of the Smart Cities and Communities Initiative of the SET-Plan. The European Commission reserves its right to ask the project during the negotiation, in case not already highlighted in the proposal, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

It is envisaged that three to five projects could be funded.

Additional information concerning aspects 1, "Retrofitting of a district towards zero energy buildings":

The scale of unit cost for European Union financial contribution is fixed at EUR 100 /m² eligible costs and thus EUR 50 /m² European Union contribution. The amounts determined on the basis of the scale of unit costs are reimbursed by applying the upper funding limits specified in Article II.16 of the model grant agreement. Therefore, the reimbursement rate will be up to 50%, i.e. EUR 50/m². The eligible costs per m² for the building demonstrated in the project(s) are fixed costs. The total of European Union financial contribution based on scale of unit costs may not exceed EUR 15 million per project. The evaluation of the proposals will also take into account under the "S&T excellence" criterion the degree of excellence and innovation of the technology used, the level of projects ambition and the most cost effectiveness of the practices to be demonstrated, given the local context (euros/efficiency gain; euros/CO₂ reduction, kWh/m²/year saved). For this reason, the above figures should be indicated in the proposal. It is strongly suggested for participants to complete and include in the proposals the Building Energy Specification Table (BEST) summarizing this information for every type of building proposed. The template of the BEST table is made available through the relevant Guide for Applicants.

II.9. Activity Energy.9: Knowledge for Energy Policy Making

Development of tools, methods and models to assess the main economic and social issues related to energy technologies. Activities will include the building of databases and scenarios for an enlarged EU and the assessment of the impact of energy and energy-related policies on security of supply, environment, society, competitiveness of the energy industry and issues of public acceptability. Of particular importance is the impact of technological progress on EU policies. Activities will include scientific support for policy development.

II.9.1. Area Energy.9.1: Knowledge Tools for Energy-Related Policy Making

No topic is opened in this area.

II.9.2. Area Energy.9.2: Scientific and Socio-Economic Support to Policy

Topic ENERGY.2013.9.2.1: European scientific multidisciplinary "think-tank" to support energy policy and to assess the potential impacts of its measures

Open in call: FP7-ENERGY-2013-2

Content/scope: The EU energy policy brings many new intellectual challenges, in particular, the need to develop a multidisciplinary approach to issues that are increasingly interconnected. Entirely new approaches and a paradigm shift on the energy system will be needed (increased used of RES, system integration approaches etc.). Environmental, economic, technical, trade and legal issues need to be addressed urgently. Similarly new multidisciplinary approaches will be needed regarding energy efficiency, the Internal Energy Market, and oil and gas security stock, but to name a few, are needed.

The 'think tank' will contribute to and enhance the European Union's ability to properly develop these issues in terms of policy research. It should bring together Europe's foremost energy, economic, legal, trade and engineering academics and experts from industry, to support the rapid development of Community policy by providing input to the assessment of potential impacts of policy alternatives and options. The 'think tank' will work on the basis of an annual work plan that anticipates and corresponds with the policy agenda; it could be supported by a network of energy policy research organisations that will analyse the issues in hand, prepare for and stimulate the debate of the 'think tank' and thus enable for and facilitate its ideas and perspectives. It would select a few topics for which it will deliver a 'think tank' report, analysing policy alternatives, against a predefine set of criteria, that in every case will include at least sustainability, security of supply and competitiveness. The 'think tank' may expand its consultation basis via internet to a broader community. The 'think tank' will closely liaise with the Commission's Strategic Energy Technologies Information System (SETIS) as it may be necessary.

The topics should be developed in relation to energy policy, especially energy technology policy. The Think Tank will also consider input from other advisory groups for technological issues.

Funding scheme: Coordination and support action (supporting)

Expected impact: To improve the knowledge support to policy making and assessing policy options.

Additional eligibility criterion: The maximum requested EU contribution shall not exceed EUR 2 000 000.

Additional information: Consortium should have a track record in delivering policy advice, including universities, research centres and industry representative organisations. The proposed project duration is 36 months. Due to the nature of the activities to be carried out, up to one project may be funded under this topic.

II.10. Activity Energy.10: Horizontal Programme Actions

The topics described in the section have a horizontal character not linked specifically to any particular technology.

II.10.1. Area 10.1: Integration of the European Energy Research Area

Topic ENERGY.2013.10.1.1: ERA-NET Plus – Bioenergy: Demonstrations of the European Industrial Bioenergy Initiative

Open in call: FP7-ERANET-2013-RTD

Content/Scope: The aim of this ERA-NET Plus is to continue to promote joint strategic planning and programming for the implementation of Bioenergy demonstration projects, in accordance with the priorities set out in the SET-Plan European Industrial Bioenergy Initiative (EIBI), as derived from the corresponding Implementation Plan¹⁴. It will involve the launch of a single joint call for proposals by the promoters of national and/or regional programmes, thereby allowing a more efficient use of existing financial resources and promoting knowledge sharing.

Demonstration plants are considered the last non-economic step to demonstrate the performance and reliability of all critical steps in a value chain, so that the first commercial unit can be designed and its performance thoroughly assessed from the outcome of the demo unit.

Funding scheme: Coordination and Support Action (coordination)

Expected impact: This ERA-NET Plus will contribute to reach the objectives of the EIBI as far as demonstration projects are concerned, i.e. it will contribute to accelerate the development and deployment of the concerned Bioenergy technologies through an enhanced and effective cooperation between the various stakeholders at European level.

Additional information: For further details concerning the implementation of the ERA-NET and ERA-NET Plus calls see Annex 4 of the Cooperation work programme.

Topic ENERGY.2013.10.1.2: ERA-NET Plus – European wind resources assessment

Open in call: FP7-ERANET-2013-RTD

Contents/scope: The aim of this ERA-NET Plus is to provide the wind energy sector with more detailed resource mapping, through the creation and publication of a new EU wind atlas based on the development of improved models for wind energy physics. It will also include a wind climate database. The atlas will cover all EU Member States as well as Member States' exclusive economic zones, both onshore and offshore.

It will involve the launch of a single joint call for proposals by the promoters of national and/or regional programmes, thereby allowing a more efficient use of existing financial

¹⁴http://setis.ec.europa.eu/activities/implementation-plans/European%20Industrial%20Bioenergy%20Initiative_-EIBI.pdf

resources.

The call for proposals will address:

- The development of new/more advanced models for assessing wind resources for wind farm development, wind turbine design, spatial planning, policy promotion, and other uses. This should involve the development of dynamical downscaling methodologies and open-source models, to enable the provision of accurate wind resource and external wind load climatology and short term prediction at high spatial resolution. These models should consider bathymetry, meteorological and oceanographic data (e.g. wave height, mean wave period and wave direction). The developed downscaling methodologies and models will be fully documented and made publicly available. It will be used to produce overview maps of wind resources and other relevant data at several heights and at horizontal resolution down to 100 meter covering EU Member States and their exclusive economic zones. The dynamical models will be improved at various scales as well as their coupling (model chain). Uncertainty estimates for models and model chains will also be published. Analysis will be performed for short term forecasting predictability.
- The validation of the models through measurement: Measurements campaigns should be coordinated and cover at least complex terrains (mountains and forests), offshore, large changes in surface characteristics (roughness change) and cold and rough climates. Campaigns will include remote sensing and advanced sensors.

Funding scheme: Coordination and Support Action (coordination)

Expected impact:

This project should contribute to:

- Reduce the uncertainties and risks related to the design and operation of large-scale wind turbines through an enhanced knowledge of wind energy physics, creation of a standard for site assessment.
- Better quantify European wind energy potential, and provide data and models (e.g. for short term prediction) that can improve spatial planning tools and help improve operations and ensure an effective and efficient deployment of wind power.

The results of this project should be made publicly available for the production of an electronic European wind atlas, including the underlying data and a new EU wind climate database, the hourly variables at each grid point (with accuracy over 10%) together with elevation and other boundary data at a horizontal resolution of 1 - 5 km. The EU climate database will include all possible air mass dynamics. Guidelines and best practices for the use of data, such as extremes and turbulence (especially relevant for micro siting) will be developed. This type of atlas should become a useful spatial planning tool for public authorities and decision-makers.

Additional information: An additional work package may envisage the international cooperation. In particular, synergies could be foreseen with the European Space Agency (ESA), the European Environment Agency (EEA), and the International Renewable Energy Agency (IRENA). Potential users of the new EU Wind Atlas should also be involved. The project should include a coordination work package to establish a link with relevant national initiatives.

A specific monitoring and knowledge sharing mechanism will be established in coordination with the European Commission.

For further details concerning the implementation of the ERA-NET and ERA-NET Plus calls see Annex 4 of the Cooperation work programme.

Topic ENERGY.2013.10.1.3: Supporting the coordination of national research activities of Member States and Associated States in the field of OCEAN energy (ERA-NET)

Open in call: FP7-ERANET-2013-RTD

Content/scope: The objective of the ERA-NET scheme is to step up the cooperation and coordination of research programmes in the field of ocean energy at national and/or regional level in the Member or Associated States through the networking of organisations involved in the support to Ocean Energy research and development. This is aimed at the development and implementation of joint programming and opening of calls.

Proposed coordination activities: This ERA-NET is expected to build upon and draw lessons from the various experiences gathered and work done in the framework of ocean energy in Europe, in order to identify the most relevant research activities to be undertaken beyond the national or regional level. Coordination activities will therefore encompass all the steps of an ERA-NET (Information exchange, definition, preparation and implementation of research activities funding of joint trans-national research actions). This ERA-NET is expected to increase the alignment between national and/or regional funding programmes leading to joint programming and opening of calls during the project lifetime.

Funding scheme: Coordination and Support Action (coordinating action)

Additional eligibility criteria: As for other ERA-NET actions, this topic is mainly addressed to bodies managing or financing national research and innovation programmes, and not for research performers. A complete description of the eligibility criteria is provided in Annex IV of this work programme.

Expected impact: Ocean energy R,D&D activities are carried out separately in several Member States. The coordination offered by this ERA-NET will allow collaboration and alignment with the work of the EERA Ocean Energy Joint Programme and will enhance synergies and raise the scattered profile of a sector having difficulties to build a mature industrial and commercial status.

Additional information: For further details concerning the implementation of the ERA-NET and ERA-NET Plus calls see Annex 4 of the Cooperation work programme.

Topic ENERGY.2013.10.1.4: Mobilising the research, innovation and educational capacities of Europe's universities

Open in call: FP7-ENERGY-2013-IRP

Content/scope: Universities play a key role in the innovation system of the SET-Plan, in particular in energy related basic science, future enabling technologies and in education and training. In addition, universities participate in the joint programmes of the European Energy Research Alliance and cooperate with industry e.g. in the framework of the European Industrial Initiatives and the Knowledge and Innovation Communities of the European Institute for Innovation and Technology.

This topic supports the cooperation among universities and between universities and other innovation actors in order to mobilise the capacities of Europe's universities to contribute to the aims of the SET-Plan and the next European research and innovation framework programme, in particular in the fields of research and education. The goal is to increase the impact of universities' involvement in the SET-Plan by reducing existing fragmentation e.g. in the educational system and by stimulating joint activities among universities and with other stakeholders, taking into account and linking to the work of existing relevant networks such

as the European Platform of Universities Engaged in Energy Research (EPUE) and the KIC Innoenergy.

This topic supports the following activities:

- Activities to ensure and facilitate coordination and information flow among universities active in energy research and with the other stakeholders of the SET-Plan. This could include organisation, management and follow up of meetings as well as setting up internet based information system.
- Mapping of research and education capacities with respect to academic research and technical personnel, research projects, partnership with industry and Masters and PhD programmes. This mapping exercise should seek to reveal the extent and degree of interdisciplinary collaboration in research and education programmes which currently exist, and how this can be maximized and further promoted.
- Development of clusters of excellence, based on areas of core competence of universities such as frontier research and education and training and design of common activities within these clusters.
- Reinforcing links to the European Energy Research Alliance and to other energy innovation actors as well as participation in relevant SET-Plan related activities such as the Education and Training Initiative.

Funding scheme: Coordination and Support Action (supporting)

Expected impact: To better coordinate and maximise the impact of universities' participation in SET-Plan activities.

Support to integrated research programmes between research performers on innovative research in support of the SET Plan Research and Innovation Agenda

Open in call: FP7-ENERGY-2013-IRP

Context/scope: Without a technological shift in our current energy system, the EU will fail on its 2050 ambitions to largely decarbonise the energy and transport sectors. Europe needs to develop and introduce into the market new generations of technologies, not just any low carbon technologies, but technologies that depart fundamentally in their underlying principles, performances and economics to stand a chance to compete with conventional energy and it needs to do so throughout the entire transition period. This long-lasting and demanding challenge places a strong call for long term research to generate new concepts and ideas and to overcome market showstoppers of these breakthrough technologies.

Europe has a long standing position in research excellence. However the race for industrial leadership that is going on worldwide is calling for unprecedented resources and capacities in cutting-edge research and it has to last for decades. If the Union is to maintain and expand its competitiveness in the global clean energy technology market, energy technology innovations requires a new more effective approach across the Union—and that approach calls for integrating much further capacities and resources in high risk technology research at EU level, shifting to a programme logic rather than a project logic.

The objective of this topic is to support the operation and delivery of integrated research programmes that bring together and integrate on a European Scale, programmes of a critical mass of research performers from different Member States, Associated Countries, and, if appropriate other third countries, to advance the longer term research agenda of the SET Plan

roadmaps¹⁵ in the fields of solar photovoltaic, wind energy, smart grids, electrochemical storage, bio-energy and Concentrated Solar Power (CSP). This topic represents a pilot exercise for a new way of working at EU level on longer-term research that could be further developed in the next European Framework Programme for Research and Innovation.

Each integrated research programme shall be focused on one of the above technology areas, including aspects related to materials. An integrated research programme shall clearly show and justify its European Added Value compared to efforts undertaken at national level. The scope and complexity of the research shall address areas that individual research programmes could not address alone and/or for which working at European level brings in economies of scale and raises significantly the level of excellence. It shall be based on a transparent governance and management structure that integrates and operates seamlessly research facilities and resources, including in-kind, from the different research programmes and organisations involved against a common research work-plan.

To this end, the integrated research programme should combine, in a closely co-ordinated manner:

- Integrating activities to lay the foundations for long-lasting research cooperation, including legal, managerial and administrative aspects.
- Exchange of researchers to ensure an efficient implementation of the research work-plan and to facilitate the co-operation between research organisations and scientific communities;
- Joint activities to foster the use of existing research facilities to create a European dimension and activities to support scientific communities and industry in their access;
- Joint research activities, to improve, in quality and/or quantity, the services provided by the programmes and to fill gaps in the existing programmes. The research shall be innovative and generate new knowledge and technologies/proof of concepts aimed at accelerating the translation of discovery-oriented scientific research into technological and providing solutions to technical showstoppers faced by industry in a timely and seamless manner.
- Transfer of knowledge activities. These activities aims at reinforcing the partnership with industry in the context of the SET Plan European Industrial Initiatives e.g., activities to foster the use of research outcomes and infrastructures by industry as well as to include industrial needs into the research priorities.
- Proposals could include actions on international cooperation, such as lab-to-lab cooperation with third countries.

The proposals shall detail the research competencies and infrastructure available within the integrated research programme to implement all necessary categories of activities. In addition the proposals shall include a description of the governance that will be established to implement the integrated research programme as well as management and resource (funding and human resources) plans. A letter of endorsement of the research institutions underpinning the integrated research programme shall be provided in the proposals. The political support from relevant national authorities should also be confirmed in the proposals.

Implementation: Support to an integrated research programme will, in this pilot phase, be given for a duration of 4 years. For all necessary categories of activities the proposal shall describe precise deliverables and the Key Performance Indicators against which the

¹⁵ Commission staff working document "A technology roadmap" [SEC(2009)1295] and Commission staff working document "Materials Roadmap Enabling Low Carbon Energy Technologies" [SEC(2011)1609]

programme will be monitored for this initial period of four years. It is not expected that the joint research activities for this initial 4 year period will cover all the research needs of the technology area selected. Therefore proposals shall be focused on areas for which concrete progress can be made within the four year period, clearly indicating those parts of the overall programme for which co-funding from the EC is sought to achieve a greater impact. Proposers should also describe the complementary activities of the integrated programme that will be developed in parallel with the co-funded activities and the expected results. Proposals shall also include a longer term work plan covering more research needs of the selected technology area and describing the capacity of the consortium and its development plan to address these needs in the future, notably in view of bridging to Horizon 2020, the next Framework Programme for Research and Innovation.

Funding Scheme: Combination of Collaborative Project and Coordination and Support Action (CP-CSA)

Expected Impact: Integrated research programmes are expected to reinforce the European Research Excellence in energy technology research by bringing a European coherence among national research operators through the pooling of research capacities and by addressing high risk, high cost, and long-term research for which there is a lack of critical mass at MS level, strong potential for economies of scale and a high demand for cutting-edge research capacities. Performers of research programmes will develop synergies and complementary capabilities in such a way as to optimise the development, use and sustainable operation of the integrated research programmes and to offer an improved access to researchers. Integrated research programmes should also contribute to increase the potential for innovation of the related research programmes, in particular by reinforcing the partnership with European industry, through e.g. transfer of knowledge and other dissemination activities, activities to foster the use of research outcomes by industry.

The scale of resources, including in-kind, brought in to the overall integrated research programme is a crucial factor for its impact and will be evaluated under the 'Impact' criterion.

Additional eligibility criteria: The maximum requested EU contribution per project shall not exceed EUR 10 million.

Additional information: Given the required maturity of the integrated research programmes, it is expected to receive a single proposal per technology area.

Up to one integrated research programme per technology area is expected to be funded. Taking into account the available budget, proposals across all technology areas will be in competition against each other.

In the framework of the SET Plan a specific monitoring and knowledge sharing mechanism will be established under the auspices of the Commission and its Information System of the SET Plan (SETIS) and the selected integrated research programmes will be requested to participate. Also, the Commission will ensure proper linking, where appropriate, between these integrated research programmes, as well as with other relevant SET Plan initiatives, in particular the European Industrial Initiatives.

Reporting will be expected to provide a complete overview on progress of the overall programme, but financial reporting will be limited to those parts receiving co-funding from the EU.

Transparency and openness are considered to be an essential element for the success of these integrated research programmes and this should be reflected in the proposals. The programmes should ensure openness to include potential new members that can fulfil the criteria defined at the proposal stage. The criteria should be fair and coherent with the selection of the founder members of the programme. Transparency and openness of the

programmes will be evaluated in the programme annual reviews.

International cooperation activities should bring added value to integrated research programmes. The programmes ultimately supported under this action could be requested to participate, in the course of the execution of the project(s), in workshops with targeted third countries to exchange information on the basis of mutual benefit and reciprocity.

Proposals will be evaluated against the evaluation criteria for CP-CSA presented in section V of this work programme.

Topics opened:

Topic ENERGY.2013.10.1.5: Integrated research programme in the field of photovoltaics

The integrated research programme supported under this topic should contribute to the medium to long term objectives of the SET Plan for photovoltaics, anticipating the long term perspective of the European Solar Industrial Initiative. It aims at preparing the next wave of industrial demonstration and deployment of photovoltaic technologies. In the two established solar cell technologies, i.e. crystalline Si and thin films, highly research-intensive drivers to pursue are the enhancement of performance at cell and module level as well as the development of low-cost, high-throughput manufacturing processes. Bottlenecks hampering the take-off of emerging technologies (e.g., organic cells) should also be addressed. In the medium/long term, these technologies could offer the advantage of very low cost active materials, low-cost substrates, low energy input, and easy upscaling.

Topic ENERGY.2013.10.1.6: Integrated research programme in the field of wind energy

The integrated research programme supported under this topic aims at preparing the next wave of industrial demonstration and deployment of wind energy technologies, especially in the offshore environment. A key objective will be to address the research challenges of the SET-Plan European Wind Industrial Initiative in a common and structured way at European level. The medium to long term research undertaken under the programme is expected to accelerate the development of efficient and cost-effective large offshore wind turbines, including their substructures and the large scale grid integration of wind energy.

Topic ENERGY.2013.10.1.7: Integrated research programme in the field of bioenergy

The integrated research programme supported under this topic should contribute to the medium to long term objectives of the SET Plan for bio-energy, anticipating the long term perspective of the European Industrial Bioenergy Initiative (EIBI). It aims at preparing for the next wave of industrial demonstrations and deployment of bioenergy technologies. It will support R&D avenues leading to the most advanced, innovative and groundbreaking bioenergy pathways, also taking into account the requirements in terms of sustainability, cost effectiveness and of the users.

Topic ENERGY.2013.10.1.8: Integrated research programme on smart grids

The integrated research programme should contribute to the medium to long term objectives of the SET Plan for Smart Grids, anticipating the long term perspective of the European Electricity Grid Initiative (EEGI); the Integrated Research Programme may include aspects

from the Smart Grids European Technology Platform Strategic Research Agenda for 2035 and aspects from the Materials Roadmap Enabling Low Carbon Energy Technologies SEC (2011) 1609.

Topic ENERGY.2013.10.1.9: Integrated research programme on electrochemical storage

Electricity Storage has been identified as a critical technology for the transition to and operation of a more sustainable and low carbon European energy system. The integrated research programme should address the critical shortcomings of existing grid-scale technologies by developing new electrochemical paths and proof-of-concept for emerging storage-component technologies. Activities should focus on proposing and developing novel and innovative designs for stationary batteries and other electrochemical devices to be used in grid-scale energy storage applications. Proposers should consider the results of document SEC (2011) 1609 – Materials Roadmap Enabling Low Carbon Energy Technologies.

Topic ENERGY.2013.10.1.10: Integrated Research Programme in the field of Concentrated Solar Power (CSP)

The Integrated Research Programme supported under this topic should contribute to the medium to long term objectives of the SET Plan in the field of CSP, anticipating the long term perspective of the Solar European Industrial Initiative (SEII). The programme aims at preparing the next wave of CSP industrial demonstration and deployment. It will support the study of innovative concepts leading to highly efficient and cost effective applications of the CSP technology, possibly in combination with other technologies. It will address current shortcomings (e.g., in terms of water consumption) as well as new avenues for CSP applications.

II.10.2. Area Energy.10.2 Other Horizontal Actions

The Ocean of Tomorrow 2013: Joining research forces to meet challenges in ocean management

The EU Strategy for Marine and Maritime Research supports the EU integrated maritime policy's objective of a thriving and sustainable maritime economy. It is a key component in reconciling the growth of maritime activities with environmental sustainability and thus it contributes to the 'Europe 2020' goal of smart, inclusive and sustainable growth for Europe. In this context, "The Ocean of Tomorrow" calls for proposals aim to foster multidisciplinary approaches and cross-fertilisation between various scientific disciplines and economic sectors on key cross-cutting marine and maritime challenges.

"The Ocean of Tomorrow 2013" third cross-thematic call will focus on marine technologies. The development of competitive and innovative marine technologies is necessary to assess and monitor the good environmental status of the seas, monitor current and new activities and contribute to their sustainable operation. "The Ocean of Tomorrow 2013" call will therefore aim at pooling the efforts of stakeholders from various disciplines and sectors in order to develop innovative marine technologies for a wide range of applications.

Three key areas will be tackled: sensing technologies that are necessary to improve reliable measurements of key parameters in the sea, new materials that can avoid bio-fouling on mobile and stationary structures, and innovative transport and deployment systems for the offshore energy sector.

The call will be implemented jointly between Theme 2 "Food, Agriculture and Fisheries, and Biotechnology" (FAFB), Theme 4 "Nanosciences, Nanotechnologies, Materials and new Production Technologies" (NMP); Theme 5 "Energy", Theme 6 "Environment (including climate change)" and Theme 7 "Transport (including Aeronautics)".

“The Ocean of Tomorrow 2013” call fiche with all relevant information can be found in the Work programme of Theme 2 ” Food, Agriculture, Fisheries and Biotechnology” (FAFB), as well as on the Participant Portal under the call page FP7-OCEAN-2013.

OCEAN 2013.4 Innovative transport and deployment systems for the offshore wind energy sector

This topic is part of the cross-thematic call “The Ocean of Tomorrow 2013: Joining research forces to meet challenges in ocean management”.

Additional topics included in this call are (please refer to the work programmes of the FAFB, NMP, Environment or Transport Theme for the complete topic description):

- *OCEAN 2013.1 - Biosensors for real time monitoring of biohazards and man made chemical contaminants in the marine environment*
- *OCEAN 2013.2 - Innovative multifunctional sensors for in-situ monitoring of marine environment and related maritime activities*
- *OCEAN 2012.3 - Innovative antifouling materials for maritime applications*

Open in call: FP7-OCEAN-2013

In its Communication "Offshore Wind Energy: Action needed to deliver on the Energy Policy Objectives for 2020 and beyond", the Commission underlines that the exploitable potential of offshore wind by 2020 is likely to be 30-40 GW, and in the 2030 time horizon it could be up to 150 GW.

In 2007, the Energy Wind Association assessed that achieving 40 GW by 2020 will mean that 7,800 turbines of 5 MW need to be built over the next 13 years. Those turbines have to be assembled, transported and installed on sites.

The Strategic Energy Technology Plan (SET-Plan) European Wind Initiative identifies transport and logistic issues as key elements for the deployment and maintenance of offshore wind farms. The TP Wind Strategic Research Agenda also points to research needs both in relation to the cost-effective installation, maintenance, operation and decommissioning of large offshore wind farms as well as to transport, logistics and equipment needs.

In its Communication on Strategic goals and recommendations for the EU's maritime transport policy until 2018, the Commission stresses that maritime transport is an important instrument of the European energy policy. Amongst others offshore servicing vessels are considered as increasingly important aspect for ensuring the well functioning of the energy market.

Research activities under this topic shall address the following aspects:

- Development of innovative and cost-effective deployment strategies for large-scale turbines, including building and testing onshore;

- Elaboration of optimal logistical processes and on-land transport links for large offshore structures;
- Design of novel vessel types and equipment for installation, maintenance and decommissioning and validation at reduced scale;
- Development of safety procedures for installation, operation and maintenance activities, regarding both offshore wind structures and the vessels;
- Improved operations and maintenance including the enhanced role of remote condition monitoring and systems with reduced human intervention;
- Development of new business models at European level for large offshore systems based on integrated life-cycle approaches;
- Development of methods and tools to assess the field performance of offshore wind farms servicing vessels and for optimised service activities in terms of lead time and energy usage.

Proposals are expected to include validation activities at reduced but industrially relevant scale using testing models and where possible tests at real scale using existing infrastructure and equipment, adapting those to validate models and management tools. Tests should also address extreme conditions. The proposal should cover both ground based and floating wind parks.

The multi-disciplinary approach of the research undertaken is essential to address the topic. Knowledge exchange with oil/gas and maritime sectors is expected. These aspects will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion related to *Implementation*.

In the framework of the SET-Plan European Industrial Initiatives, a specific monitoring and knowledge sharing mechanism will be established under the auspices of the Commission and the selected project will be expected to participate.

Funding Scheme: Collaborative Project

Up to one project may be funded.

Additional eligibility criteria:

The requested European Union contribution shall not exceed EUR 10 000 000 per proposal.

Expected impact:

The project will:

- Contribute to the implementation of the roadmap activity of the European Wind Initiative aiming at supporting offshore take-off in the medium-term;
- Contribute to the development of new niche markets for the European shipbuilding and shipping industries thereby contributing to competitiveness of the sector and to the creation of new jobs.

III. IMPLEMENTATION OF CALLS

For description of the topics of the calls, please refer to section II 'Content of calls'.

III.1. FP7-ENERGY-2013-1

Call title: Energy Call Part 1

- **Call identifier:** FP7-ENERGY-2013-1
- **Date of publication:** 10 July 2012 ¹⁶
- **Deadline:** 28 November 2012 at 17.00.00, (Brussels local time)¹⁷
- **Indicative budget** ¹⁸: EUR 107.5 million from the 2013 budget¹⁹, of which
 - EUR 105.5 million from Theme 5 – Energy
 - EUR 2 million from Theme 2 – Food, Agriculture and Fisheries, and Biotechnology (FAFB)²⁰

Challenge	Activities / Areas / Topics in this work programme	Indicative budget
Renewable energies	Area Energy 2.1: Photovoltaics Area Energy 2.3: Wind Area Energy 2.4: Geothermal energy Area Energy 2.6: Ocean energy Area Energy 2.9: Cross-Cutting Issues Area Energy.4.1: Low/Medium Temperature Solar Thermal Energy	EUR 51 million
Renewable energies	Topic ENERGY.2013.3.7.1: Support to the sustainable delivery of non-food biomass feedstock at local, regional and pan-European level	EUR 4 million ²¹
Smart grids / energy storage	Area Energy 2.7: Hydro energy Activity Energy.7: Smart Energy Networks	EUR 24 million

¹⁶ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

¹⁷ The Director-General responsible may delay this deadline by up to two months.

¹⁸ Reserve lists per sub-area of the indicative budget table will be constituted if there are a sufficient number of good quality proposals. It will be used if extra budget becomes available.

¹⁹ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

²⁰ The contribution of the FAFB Theme is for topic 3.7.1.

²¹ Both the Energy and the FAFB Theme will each contribute EUR 2 million for this topic.

Carbon Capture and Storage	Activity Energy.5: Co2 Capture and Storage Technologies for Zero Emission Power Generation	EUR 28.5 million
	Activity Energy.6: Clean Coal Technologies	

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call sub-budgets may also vary by up to 10% of the total value of the indicated budget for the call.

• **Topics called:**

Activity/ Area	Topics called	Funding Schemes and eligibility criteria
ACTIVITY ENERGY.2: RENEWABLE ELECTRICITY GENERATION		
Area Energy 2.1: Photovoltaics	ENERGY.2013.2.1.1 <i>Up to one project may be funded</i>	Collaborative Project
Area Energy 2.3: Wind	ENERGY.2013.2.3.1 <i>Up to one project may be funded</i>	Collaborative Project
	ENERGY.2013.2.3.2 <i>Up to one project may be funded</i>	Collaborative Project
Area Energy 2.4: Geothermal energy	ENERGY.2013.2.4.1 <i>Up to one project may be funded</i>	Collaborative Project
Area Energy 2.6: Ocean energy	ENERGY.2013.2.6.1 <i>Up to one project may be funded</i>	Collaborative Project
Area Energy 2.7: Hydro energy	ENERGY.2013.2.7.1 <i>Up to one project may be funded</i>	Collaborative Project
Area Energy 2.9: Cross-Cutting Issues	ENERGY.2013.2.9.1 <i>Up to two projects may be funded</i>	Collaborative project for specific international cooperation actions (SICA)
	ENERGY.2013.2.9.2 <i>Up to one project may be funded</i>	Collaborative Project <i>The maximum requested EU contribution per project shall not exceed EUR 3</i>

		<i>million.</i>
ACTIVITY ENERGY.3: RENEWABLE FUEL PRODUCTION		
Area Energy 3.7: Cross-Cutting Issues	ENERGY.2013.3.7.1 <i>Up to one project may be funded</i>	Collaborative Project
ACTIVITY ENERGY.4: RENEWABLES FOR HEATING AND COOLING		
Area Energy.4.1: Low/Medium Temperature Solar Thermal Energy	ENERGY.2013.4.1.1 <i>Up to one project may be funded</i>	Collaborative Project
ACTIVITY ENERGY.5: CO₂ CAPTURE AND STORAGE TECHNOLOGIES FOR ZERO EMISSION POWER GENERATION		
Area Energy 5.1: CO ₂ Capture	ENERGY.2013.5.1.1	Collaborative Project <i>The maximum requested EU contribution per project shall not exceed EUR 8 million.</i>
	ENERGY.2013.5.1.2	Collaborative Project
Area Energy 5.2: CO ₂ Storage	ENERGY.2013.5.2.1	Collaborative Project
ACTIVITY ENERGY.6: CLEAN COAL TECHNOLOGIES		
Area Energy 6.1: Conversion Technologies for Zero Emission Power Generation	ENERGY.2013.6.1.1 <i>Up to one project may be funded</i>	Collaborative Project
ACTIVITY ENERGY.7: SMART ENERGY NETWORKS		
Area Energy 7.2: Pan-European Energy Networks	ENERGY.2013.7.2.1	Collaborative Project
	ENERGY.2013.7.2.2	Collaborative Project
	ENERGY.2013.7.2.4 <i>Up to one project may be funded</i>	Collaborative Project
Area Energy 7.3: Cross Cutting Issues and Technologies	ENERGY.2013.7.3.3	Collaborative Project

- **Eligibility conditions**

- The general eligibility criteria for this call are set out in Annex 2 to the work programme, and in the Guide for Applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- The minimum number of participating legal entities required, for all funding schemes,

is set out in the Rules for Participation. They are summarised in the table below²²:

Funding scheme	Minimum conditions
Collaborative Project	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Collaborative project for specific international cooperation actions (SICA)	At least 4 independent legal entities. Of these, 2 must be established in different MS or AC. The other two must be established in different international cooperation partner countries.
Coordination and Support Action (coordinating action)	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Coordination and Support Action (supporting action)	At least 1 independent legal entity.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

Additional eligibility criteria:

- Topic ENERGY.2013.2.9.2: Methods for the estimation of the Direct Normal Irradiation (DNI): The requested EU contribution per project shall not exceed EUR 3 Million
- Topic ENERGY.2013.5.1.1: Scale-up of advanced high-efficiency capture processes: The requested EU contribution per project shall not exceed EUR 8 Million

• **Evaluation procedure:**

- The evaluation criteria and scoring scheme are set out in annex 2 of the work programme.
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
- The Commission will instruct the experts to disregard any pages exceeding these limits.
- The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).

²² MS = Member States of the EU; AC = Associated country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated country.

- Proposals will not be evaluated anonymously.
- The evaluation for these topics shall follow a one stage procedure.

Evaluation criteria and thresholds:

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

The procedure for prioritising proposals with equal scores:

Ranked lists of proposals will be established for each section of the indicative budget table above. At the Panel stage, in contrast to Annex 2, proposals with equal overall scores will be prioritised according to their scores for the 'impact' criterion. If they are still tied, they will be prioritised according to their scores for the 'Scientific and/or technological (S/T) excellence' criterion. If any proposals are still tied, then overall Work Programme coverage will be used to decide the priority order. Reserve lists per sub-area of the indicative budget table will be constituted if there are a sufficient number of good quality proposals. It will be used if extra budget becomes available.

The maximum number of projects that may be funded under a specific topic is restricted in the following topics:

- Topic ENERGY.2013.2.1.1: High efficiency c-Si photovoltaics modules: Up to one project may be funded
- Topic ENERGY.2013.2.3.1: Advanced aerodynamic modelling, design and testing for large rotor blades: Up to one project may be funded
- Topic ENERGY 2013.2.3.2: Small to medium size wind turbines: Up to one project may be funded
- Topic ENERGY.2013.2.4.1: Exploration and assessment of geothermal reservoirs: Up to one project may be funded
- Topic ENERGY.2013.2.6.1: Design tools, enabling technologies and underpinning research to facilitate ocean energy converter arrays: Up to one project may be funded
- Topic ENERGY.2013.2.7.1: Optimisation of Water Turbines: Up to one project may be funded
- Topic ENERGY.2013.2.9.1: Research cooperation and knowledge creation in the area of renewable energy with Mediterranean partner countries: Up to two projects may be funded

- Topic ENERGY.2013.2.9.2: Methods for the estimation of the Direct Normal Irradiation (DNI): Up to one project may be funded
- Topic ENERGY.2013.3.7.1: Developing regional and pan-European schemes for the sustainable delivery of non-food biomass feedstock in a pan-European integrated market: up to one project may be funded
- Topic ENERGY.2013.4.1.1: Research and development of innovative solar thermal facades: up to one project may be funded
- Topic ENERGY.2013.6.1.1: Combined Underground Coal Gasification and CO2 Capture and Storage: up to one project may be funded
- Topic ENERGY.2013.7.2.4: Ensuring stakeholder support for future grid infrastructures: up to one project may be funded

- **Indicative evaluation timetable:**

- Evaluation: December 2012 / January 2013
- Evaluation results: estimated to be available within two months after the closure date.

- **Consortia agreements:**

Participants in Collaborative Projects are required to conclude a consortium agreement; participants in Coordination and Support Actions are encouraged, but not required, to conclude a consortium agreement.

- **Forms of grants and maximum reimbursement rates:**

Further information on the offered grants and reimbursement rates are specified in Annex 3 to the Cooperation work programme.

- **Flat rates to cover subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

- **Dissemination:**

Grant agreements of projects financed under this call for proposals will include the special clause 39 on the "Open Access Pilot in FP7". Under this clause, beneficiaries are required to make their best efforts to ensure free access to peer-reviewed articles resulting from projects via an institutional or subject-based repository, and to make their best efforts to ensure open access to these articles within six months²³.

²³ Further information: http://cordis.europa.eu/fp7/find-doc_en.html, http://ec.europa.eu/research/science-society/open_access, http://ec.europa.eu/research/science-society/scientific_information/.

III.2. FP7-ENERGY-2013-2

Call title: Energy Call part 2

- **Call identifier:** FP7-ENERGY-2013-2
- **Date of publication:** 10 July 2012²⁴
- **Deadline:** 24 January 2013 at 17.00.00, Brussels local time²⁵
- **Indicative budget:** EUR 83 million²⁶

Activity	Indicative Budget (EUR million)
Activity Energy.3: Renewable Fuel Production	36
Activity Energy.7: Smart Energy Networks	45
Activity Energy.9: Knowledge for Energy Policy Making	2

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call sub-budgets may also vary by up to 10% of the total value of the indicated budget for the call.

²⁴ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

²⁵ The Director-General responsible may delay this deadline by up to two months.

²⁶ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

- **Topics called:**

Activity/ Area	Topics called	Funding Schemes and eligibility criteria
ACTIVITY ENERGY.3: RENEWABLE FUEL PRODUCTION		
Area Energy.3.2: Second Generation Fuel from Biomass	ENERGY.2013.3.2.1: Pre-commercial industrial scale demonstration plant on paraffinic biofuels for use in aviation	Collaborative Project with a predominant demonstration component
ACTIVITY ENERGY.7: SMART ENERGY NETWORKS		
Area Energy.7.2: Pan-European Energy Networks	ENERGY.2013.7.2.3: Large-scale demonstration of innovative transmission system integration and operation solutions for (inter)connecting renewable electricity production.	Collaborative Project with a predominant demonstration component
ACTIVITY ENERGY.9: KNOWLEDGE FOR ENERGY POLICY MAKING		
Area Energy.9.2: Scientific Support to Policy	ENERGY.2013.9.2.1: European scientific multidisciplinary "think-tank" to support energy policy and to assess the potential impacts of its measures.	Coordination and support action (supporting) <i>Maximum requested EU contribution of EUR 2 000 000</i>

- **Eligibility criteria:**

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

The minimum number of participating legal entities required, for all funding schemes, is set out in the Rules for Participation. They are summarised in the table below²⁷:

Funding scheme	Minimum conditions
Collaborative Projects	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC

²⁷ MS = Member States of the EU; AC = Associated Country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated Country.

Coordination and Support Actions (coordinating action)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (supporting action)	At least 1 independent legal entity.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Evaluation procedure:**

- The evaluation criteria and scoring scheme are set out in annex 2 of the work programme.

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of 0.5 point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

The Commission will instruct the experts to disregard any pages exceeding these limits.

The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).

- The evaluation shall follow a single stage procedure.
- Where mentioned in the topic description, "predominant demonstration component" refers to the elements described in the Guide for Applicants.
- The procedure for prioritising proposals with equal scores is described below:

Ranked lists of proposals will be established for each activity. At the Panel stage, proposals with equal overall scores will be prioritised according to their scores for the Quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If any proposals are still tied, then overall Work Programme coverage will be used to decide the priority order. A reserve list will be

constituted if there are a sufficient number of good quality proposals. It will be used if extra budget becomes available.

Indicative timetable: Evaluations are expected to be carried out in March 2013. It is expected that the negotiations with the proposals of the main list will open by May 2013, in view of signing the Grant Agreements by December 2013.

Consortia agreements: Participants in Collaborative Projects are required to conclude a consortium agreement.

The forms of grants and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.

Flat rates to cover subsistence costs: In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

Dissemination: Grant agreements of projects financed under this call for proposals will include the special clause 39 on the "Open Access Pilot in FP7". Under this clause, beneficiaries are required to make their best efforts to ensure free access to peer-reviewed articles resulting from projects via an institutional or subject-based repository, and to make their best efforts to ensure open access to these articles within six months²⁸

²⁸ Further information: http://cordis.europa.eu/fp7/find-doc_en.html, http://ec.europa.eu/research/science-society/open_access, http://ec.europa.eu/research/science-society/scientific_information/.

III.3. FP7-SMARTCITIES-2013

Smart Cities is a target research and innovation area in the future European Framework Programme for Research and Innovation. In order to prepare the constituency, the Themes ICT and ENERGY are launching this Cross-Thematic call.

Call title: "Smart Cities and Communities"

- **Call identifier:** FP7-SMARTCITIES-2013
- **Date of publication:** 10 July 2012²⁹
- **Deadline:** 4 December 2012³⁰ at 17.00.00 (Brussels local time).
- **Indicative budget**^{31,32} : EUR 209 million from the budget of which:
 - EUR 95 million from Theme 3 – Information and Communication Technologies (ICT)
 - EUR 114 million from Theme 5 – Energy

Activity/ Area	Budget (Million EUR)
Theme 3 – Information and Communication Technologies (ICT)	
FP7-ICT-2013.1.4	20
FP7-ICT-2013.6.2	20
FP7-ICT-2013.6.4	40
FP7-ICT-2013.6.6	15
Theme 5 – Energy	
Area Energy.7.1: Development of Inter-Active Distribution Energy Networks	24
Area Energy 7.3: Cross Cutting Issues and Technologies	
Area ENERGY.8.8: Smart Cities and Communities	90

²⁹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

³⁰ The Director-General responsible may delay this deadline by up to two months

³¹ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

³² The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- the final budget of the call may vary by up to 10% of the total value of the indicated budget for the call; and
- any repartition of the call sub-budgets may also vary by up to 10% of the total value of the indicated budget for the call.

- **Topics called:**

Activity/ Area	Topics called	Funding Schemes
Theme 3 – Information and Communication Technologies (ICT)		
FP7-ICT-2013.1.4	A reliable, smart and secure Internet of Things for Smart Cities	Collaborative Projects (STREP only) and CSA
FP7-ICT-2013.6.2	Data Centres in an energy-efficient and environmental friendly Internet	Collaborative Projects (STREP only)
FP7-ICT-2013.6.4	Optimising Energy Systems in Smart Cities	Collaborative Projects (STREP only) and CSA
FP7-ICT-2013.6.6	Integrated personal mobility for smart cities	Collaborative Projects (STREP only)
Theme 5 – Energy		
Area Energy.7.1: Development of Inter-Active Distribution Energy Networks	Topic ENERGY.2013.7.1.1: Development and validation of methods and tools for network integration of distributed renewable resources	Collaborative Project
Area Energy 7.3: Cross Cutting Issues and Technologies	Topic ENERGY.2013.7.3.1: Planning rules for linking electric vehicles (EV) to distributed energy resources <i>Up to one project may be funded</i>	
	Topic ENERGY.2013.7.3.2: Enhanced interoperability and conformance testing methods and tools for interaction between grid infrastructure and electric vehicles <i>Up to one project may be funded</i>	
Area ENERGY.8.8: Smart Cities and Communities	Topic ENERGY.2013.8.8.1: Demonstration of optimised energy systems for high performance-energy districts	Collaborative Project with a predominant demonstration component

The topics FP7.ENERGY.2013.8.8.1 and FP7-ICT-2013.6.4 contribute to the objectives of the Energy-Efficient building PPP.

Other topics related to Smart Cities and Communities, but not included in this call, are:

- Call FP7-ICT-2013-GC, GC-ICT-2013.6.7: Electro-mobility, see Theme 3 (ICT), part of PPP Green Cars
- Call FP7-2013-NMP-ENV-EeB, EeB.NMP.2013-3: Integration of technologies for energy-efficient solutions in the renovation of public buildings,

see Theme 4 (NMP), part of PPP EeB

- Call FP7-2013-NMP-ENV-EeB, EeB.NMP.2013-4: Integrated control systems and methodologies to monitor and improve building energy performance
see Theme 4 (NMP), part of PPP EeB
- Call FP7-2013-NMP-ENV-EeB, EeB.NMP.2013-5: Optimised design methodologies for energy-efficient buildings integrated in the neighbourhood energy systems
see Theme 4 (NMP), part of PPP EeB
- Call FP7-2013-NMP-ENV-EeB, EeB.NMP.2013-6: Achieving high efficiency by deep retrofitting in the case of commercial buildings
see Theme 4 (NMP), part of PPP EeB
- Call FP7-2013-NMP-ENV-EeB, EeB.ENV.2013.6.3-4: Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts,
see Theme 6 (ENV), part of PPP EeB

- **Eligibility conditions**

The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. They are summarised in the table below:

Funding scheme	Minimum conditions
Collaborative Projects	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (coordinating action)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (supporting action)	At least 1 independent legal entity.

- **Evaluation procedure**

A one-stage submission procedure will be followed.

Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

Each Theme will be responsible for its own budget and for the implementation of the respective call topics. This includes drawing up ranking lists per budgetary envelope and

subsequent negotiation and follow-up of the grant agreements resulting from the proposals selected under the respective call topics.

For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

See also Annex 2: Eligibility and evaluation criteria for proposals and priority order for proposals with the same score.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

The maximum number of projects that may be funded under a specific topic is restricted in the following topics:

- Topic ENERGY.2013.7.3.1: Planning rules for linking electric vehicles (EV) to distributed energy resources: up to one project may be funded
- Topic ENERGY.2013.7.3.2: Enhanced interoperability and conformance testing methods and tools for interaction between grid infrastructure and electric vehicles: up to one project may be funded

- **Indicative evaluation and contractual timetable:**

Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

- **Consortia agreements**

Consortia agreements are required for *all* actions.

- **Particular requirements for participation, evaluation and implementation:**

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up for each budget envelope as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

The forms of grants and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.

III.4. FP7-ENERGY-2013-IRP

Call title: Energy Call for supporting integrated research programmes

- **Call identifier:** FP7-ENERGY-2013-IRP
- **Date of publication:** 10 July 2012³³
- **Deadline:** 8 January 2013 at 17.00.00, (Brussels local time)³⁴
- **Indicative budget**³⁵: EUR 37.5 million from the 2013 budget³⁶

Challenge	Activities/ Topics in this work programme	Indicative budget
Integration of Research Programmes	<p>ENERGY.2013.10.1.5: Integrated research programme in the field of photovoltaics</p> <p>ENERGY.2013.10.1.6: Integrated research programme in the field of wind energy</p> <p>ENERGY.2013.10.1.7: Integrated research programme in the field of bioenergy</p> <p>ENERGY.2013.10.1.8: Integrated research programme on smart grids</p> <p>ENERGY.2013.10.1.9: Integrated research programme on electrochemical storage</p> <p>ENERGY.2013.10.1.10: Integrated Research Programme in the field of Concentrated Solar Power (CSP)</p>	EUR 35 million
Support to Platforms	<p>ENERGY.2013.2.1.2: Support to key activities of the European Photovoltaics Technology Platform (TP PV)</p> <p>ENERGY.2013.3.7.2: Support to key activities of the European Biofuels Technology Platform (EBTP)</p> <p>ENERGY.2013.10.1.4: Mobilising the research, innovation and educational capacities of Europe's universities</p>	EUR 2.5 million

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

³³ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

³⁴ The Director-General responsible may delay this deadline by up to two months.

³⁵ Reserve lists per sub-area of the indicative budget table will be constituted if there are a sufficient number of good quality proposals. It will be used if extra budget becomes available.

³⁶ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call sub-budgets may also vary by up to 10% of the total value of the indicated budget for the call.

• **Topics called:**

Activity/ Area	Topics called	Funding Schemes and eligibility criteria
ACTIVITY 2: RENEWABLE ELECTRICITY GENERATION		
Area Energy 2.1: Photovoltaics	ENERGY.2013.2.1.2 <i>(up to one project may be funded)</i>	Coordination and Support action (supporting action) <i>The maximum requested EU contribution per project shall not exceed EUR 500 000.</i>
ACTIVITY ENERGY.3: RENEWABLE FUEL PRODUCTION		
Area Energy 3.7: Cross-Cutting Issues	ENERGY.2013.3.7.2 <i>(up to one project may be funded)</i>	Coordination and support action (supporting action) <i>The maximum requested EU contribution per project shall not exceed EUR 500 000.</i>
ACTIVITY ENERGY.10: HORIZONTAL PROGRAMME ACTIONS		
Area Energy.10.1: Integration of the European Energy Research Area	ENERGY.2013.10.1.4: <i>(up to one project may be funded)</i>	Coordination and support action (supporting action)
	ENERGY.2013.10.1.5 <i>(up to one project may be funded)</i>	Combination of Collaborative Project and Coordination and Support Action (CP-CSA) <i>(Requested EU contribution per project shall not exceed EUR 10 Million)</i>
	ENERGY.2013.10.1.6 <i>(up to one project may be funded)</i>	Combination of Collaborative Project and Coordination and Support Action (CP-CSA) <i>(Requested EU contribution per project shall not exceed EUR 10 Million)</i>
	ENERGY.2013.10.1.7 <i>(up to one project may be funded)</i>	Combination of Collaborative Project and Coordination and Support Action (CP-CSA) <i>(Requested EU contribution per</i>

		<i>project shall not exceed EUR 10 Million)</i>
	ENERGY.2013.10.1.8 <i>(up to one project may be funded)</i>	Combination of Collaborative Project and Coordination and Support Action (CP-CSA) <i>(Requested EU contribution per project shall not exceed EUR 10 Million)</i>
	ENERGY.2013.10.1.9 <i>(up to one project may be funded)</i>	Combination of Collaborative Project and Coordination and Support Action (CP-CSA) <i>(Requested EU contribution per project shall not exceed EUR 10 Million)</i>
	ENERGY.2013.10.1.10 <i>(up to one project may be funded)</i>	Combination of Collaborative Project and Coordination and Support Action (CP-CSA) <i>(Requested EU contribution per project shall not exceed EUR 10 Million)</i>

- **Eligibility conditions**

- The general eligibility criteria for this call are set out in Annex 2 to the work programme, and in the Guide for Applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- The minimum number of participating legal entities required, for all funding schemes, is set out in the Rules for Participation. They are summarised in the table below³⁷:

Funding scheme	Minimum conditions
Collaborative Project	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Combination of Collaborative Project and Coordination and Support Action (CP-CSA)	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Coordination and Support Action (coordinating action)	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.
Coordination and Support Action (supporting action)	At least 1 independent legal entity.

³⁷ MS = Member States of the EU; AC = Associated country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated country.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

Additional eligibility criteria:

Requested EU contribution per project shall not exceed EUR 10 Million for the following topics:

- ENERGY.2013.10.1.5
- ENERGY.2013.10.1.6
- ENERGY.2013.10.1.7
- ENERGY.2013.10.1.8
- ENERGY.2013.10.1.9
- ENERGY.2013.10.1.10

Requested EU contribution per project shall not exceed EUR 500 000 for the following topics:

- ENERGY.2013.2.1.2
- ENERGY.2013.3.7.2

• **Evaluation procedure:**

- The evaluation criteria and scoring scheme are set out in annex 2 of the work programme.
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
- The Commission will instruct the experts to disregard any pages exceeding these limits.
- The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).
- Proposals will not be evaluated anonymously.
- The evaluation for these topics shall follow a one stage procedure.

Evaluation criteria and thresholds

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5

Implementation	3/5
Impact	3/5
Overall threshold required	10/15

The procedure for prioritising proposals with equal scores:

Ranked lists of proposals will be established for each section of the indicative budget table above. At the Panel stage, in contrast to Annex 2, proposals with equal overall scores will be prioritised according to their scores for the 'Impact' criterion. If they are still tied, they will be prioritised according to their scores for the 'Scientific and/or technological (S/T) excellence' criterion. If any proposals are still tied, then overall Work Programme coverage will be used to decide the priority order. Reserve lists per sub-area of the indicative budget table will be constituted if there are a sufficient number of good quality proposals. It will be used if extra budget becomes available.

- **Indicative evaluation timetable:**

- Evaluation: February 2013
- Evaluation results: estimated to be available within two months after the closure date.

- **Consortia agreements:** Required for all projects.

- **Forms of grants and maximum reimbursement rates:**

Further information on the offered grants and reimbursement rates are specified in Annex 3 to the Cooperation work programme.

- **Flat rates to cover subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

- **Dissemination:**

Grant agreements of projects financed under this call for proposals will include the special clause 39 on the "Open Access Pilot in FP7". Under this clause, beneficiaries are required to make their best efforts to ensure free access to peer-reviewed articles resulting from projects via an institutional or subject-based repository, and to make their best efforts to ensure open access to these articles within six months³⁸.

³⁸ Further information: http://cordis.europa.eu/fp7/find-doc_en.html, http://ec.europa.eu/research/science-society/open_access, http://ec.europa.eu/research/science-society/scientific_information/.

IV. OTHER ACTIONS

The activities described in this section fall outside of the mainstream 'calls for proposals' means of implementation of the work programme³⁹. Funds will be made available to support the following activities

- a) Contributions to the IEA
- b) Calls for tender
- c) Grants to named beneficiaries
- d) Expert appointment
- e) Evaluation, monitoring and review

a) International Energy Agency

The Commission represents the European Union in the Implementing Agreements (hereinafter 'IAs') concluded under the framework of the International Energy Agency where it participates in activities in certain areas of energy research.

The Commission will make annual financial contributions required by its participation, up to a total amount of EUR 300.000. The annual financial contributions will be paid to the entities responsible for managing the respective agreements. The table below shows only those IAs for which the financial contribution will be paid from the budget of this part of the Cooperation work programme. It is not an exhaustive list of all of the IAs to which the Commission participates.

The Commission is reviewing its involvement in IEA activities and may decide to withdraw its participation in specific IAs, or to participate in additional activities agreed under the IAs mentioned below or in any other existing or future IA and in any other activities of the IEA where such participation is in the interest of the EU, in line with the objectives and priorities of the present work programme, and within the limits of the budgetary provisions. The outcome of the current review might affect the Commission's contributions and corresponding payments to the IEA. The table below will be updated in any future modifications of the work programme.

³⁹ Funding Scheme Coordination and Support Actions (supporting action), in accordance with Article 14 (a), (b), and (c), 17 and 27(5) and other actions in accordance with Article 14 (d) of the FP7 Rules for Participation.

IEA Implementing Agreements financed under the Energy work programme^{40, 41}:

Implementing Agreement	Date IA signed by the European Commission	Estimated Annual EU Contribution in nominal currency	Estimated Annual EU Contribution in Euro (Exchange rate 16/03/2012)
IEA Implementing Agreement for Co-operation in the Research and Development of Wind Turbine Systems	Commission signature in 1996. Extended until 2013.	EUR 15 000	15 000
IEA Implementing Agreement for the Establishment of a Project on Solar Power and Chemical Energy Systems	Commission signature in 1998.	EUR 5 250	5 250
Programme to Develop and Test Solar Heating & Cooling Systems	Commission signature in 1979. Extended until 2013	EUR 5 100	5 100
IEA Implementing Agreement for a Programme of Research, Development and Demonstration on Bioenergy	Commission signature in 1995. Extended until 2014.	USD 68 200	49 600
IEA Geothermal Implementing Agreement	Commission signature in 1997.	EUR 10 300	10 300
IEA Implementing Agreement on Photovoltaic Power System Programme	Commission signature in 1992.	EUR 8 500	8 500
IEA Implementing Agreement for the establishment of IEA Coal Research	Commission signature in 1989. Extended until 2013.	GBP 78 348	89 000
IEA Implementing Agreement for a Co-operative Programme on Technologies Relating to Greenhouse Gases derived from Fossil Fuel Use	Commission signature in 1991.	GBP 62 287	72 900

⁴⁰ As a contribution from the EU in accordance with Article 108 (2) (d) of the Financial Regulations applicable to the General Budget of the European Communities.

⁴¹ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority

b) Calls for tender

Subject (indicative title)	Indicative budget in Euro	Expected duration	Indicative timetable
Support to the activities of the Smart Cities and Communities Stakeholder Platform	1 000 000	36 months	1 st semester 2013

Support to the activities of the Smart Cities and Communities Stakeholder Platform

The objective of this action is to support the activities of the Smart Cities Stakeholder Platform within the context of the Commission's activities in the development of innovative solutions for future large-scale commercial roll-out in EU cities.

Such activities shall include:

- Provision of European-wide appraisal, outreach and liaison activities relating to the Commission's Smart Cities projects and activities.
- Maintenance, revision and implementation of the Smart Cities and Communities Strategic Implementation Plan with regard to stakeholder engagement.
- Analysis and follow-up of the technological, regulatory, financial and market context of smart cities in Europe, taking into account developments in Europe and worldwide, and providing open information on these issues through reports, factsheets, newsletters, the website and – if suitable - other means.
- Close follow-up and further development of the work carried out in the technology-focused working groups of the Platform. These are currently: Energy Supply Networks, Energy Efficiency and Sustainable Transport. In addition, creation of sub-groups to support activities of these working groups and address key challenges as appropriate.
- Close follow-up and further development of horizontal activities of the Platform, such as the working group on finance challenges.
- Liaising with other relevant initiatives and partners at EU and Member States levels.

The platform should perform its work as an information hub for stakeholders, especially those operating locally at the urban level, and as a provider of bottom-up feedback to the European Commission. The successful tender is expected to include *inter alia* the following tasks:

- Maintenance and further development of the Platform's website including e.g. a toolbox for stakeholders providing best practises, a project/business partner search facility, publications and EU-funded project results;
- Provision of concrete recommendations for future Smart Cities and Communities activities for the EU, such as possible subjects to be covered under EU research and innovation programmes;
- Provision of secretarial support to and coordination of the working groups.
- Organisation of dissemination, discussion and/or networking events open to all stakeholders, including at least an annual conference to present and draw conclusions from EU-funded project results and the outcomes of the working groups.

The retained tender should build on the already existing instruments and tools of the Platform and develop them further in line with the evolution of the Commission's activities in the area of Smart Cities & Communities.

c) Grants to named beneficiaries

Support to the Irish Presidency Conference on the European Strategic Energy Technology Plan (SET-Plan)

Content/scope: Ireland will be organising the EU Technology Summit. The conference will take place in Ireland during the Irish Presidency of the Council of the European Union.

The EU contribution will be implemented as a grant to a named beneficiary. It will be evaluated in accordance with the standard FP7 evaluation criteria (including weight and thresholds) and sub-criteria, together with an eligibility, selection and award criteria for the funding scheme as set out in Annex 2 of this work programme.

Indicative budget: EUR 175 000

Funding scheme: Coordination and Support Action (supporting action) – grant to a named beneficiary

Additional information: The EU contribution will not represent more than 50% of the total eligible costs.

The proposal will be evaluated in accordance with the standard FP7 evaluation criteria (including weight and thresholds) and sub-criteria, together with an eligibility, selection and award criteria for the funding scheme as set out in Annex 2 of this work programme.

A grant may be awarded to the following named beneficiary:

Sustainable Energy Authority of Ireland
Wilton Park House
Wilton Place
Dublin 2
Ireland

Grant to named beneficiaries for supporting the evolution of the European Energy Research Alliance (EERA-SET Plan)

Contents/scope: The European Energy Research Alliance of the SET-Plan (EERA) has been established on 27 October 2008 with the close collaboration and support of the European Commission. The key objective of the EERA is to accelerate the development of new energy technologies by conceiving and implementing Joint Research Programmes in support of the Strategic Energy Technology (SET) Plan. The EERA is now operating 13 Joint Programmes in the fields of Photovoltaic, Wind Energy, Smart Grids, Geothermal, Carbon Capture and Storage, Materials for Nuclear, Bioenergy, Concentrated Solar Power, Ocean, Smart Cities, Advanced Materials and Processes for Energy Applications, Energy Storage and Fuel Cells and Hydrogen. More than 2000 researchers from over 125 research institutes are actively collaborating today in the EERA Joint Programmes.

This grant aims at supporting the further development of the EERA under the next European research and innovation framework programme, the next Framework Programme for

Research and Innovation. The goal is to consolidate the EERA as a key mechanism at EU level to address critical research areas of European interest that are beyond the reach of a single Member State and are critical for the technology research agenda and to develop a European research offer that facilitates industry access to knowledge and research results to fully exploit the internal market potential. To this end, following activities should be combined in this grant:

- Strategic activities to investigate and implement management structures in line with the future goals of the EERA described above as well as to expand the scope of EERA Joint Programmes. This could include a Secretariat task to ensure the organisation, management and follow up of conferences and meetings among EERA participants as well as of the annual General assembly. Consideration should also be given to providing support to facilitate the work of Joint Programme Coordinators and to help optimise the participation of Universities in the EERA.
- Cooperation activities to facilitate the flow and exchange of information within the SET-Plan Stakeholders (Research Institutes, Universities in particular the EPUE, international partners, SETIS), and to reinforce the cooperation with the European Industrial Initiatives of the SET-Plan (EIIs) and others partners (KiCs, ETPs, JTIs)
- Dissemination activities that could include the development and maintenance of IT tools (EERA website), as well as the preparation of information leaflets, brochures, reports and other relevant documents.

Funding scheme: Coordination and Support Action – grant to a named beneficiary

Indicative budget: EUR 1 200 000

Additional eligibility criteria: The EU contribution shall be a maximum of 50% of the total eligible costs.

The proposal will be evaluated in accordance with the standard FP7 evaluation criteria (including weight and thresholds) and sub-criteria, together with an eligibility, selection and award criteria for the funding scheme as set out in Annex 2 of this work programme.

A grant may be awarded to the following named beneficiaries:

Energy research Centre of the Netherlands (ECN)
P.O. Box 1
1755 ZG Petten
The Netherlands

Commissariat à l'énergie atomique et aux énergies alternatives (CEA)
Bâtiment le ponant
Rue Leblanc, 25
75015 Paris
France

Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Economico Sostenibile (ENEA)
Lungotevere Thaon di Revel, 76
00196 Rome
Italy

Helmholtz-Gemeinschaft Deutscher Forschungszentren / Helmholtz Association (HGF)
Anna-Louisa-Karsch-Straße 2
10178 Berlin
Germany

Technical University of Denmark – DTU
Anker Engelunds Vej 1
Building 101A
2800 Kongens Lyngby
Denmark

Teknologian tutkimuskeskus VTT
Vuorimiehentie 5
02044 VTT
Finland

d) External expertise

Independent experts will be appointed to provide analyses of past activities in policy relevant areas and to advise on or support the design and implementation of EU Research Policy, for example by assisting the Commission in conducting the second interim evaluation of the Fuel Cells and Hydrogen Joint Undertaking.

The indicative budget for this activity is EUR 100 000.

Funding scheme: Coordination and Support Action (supporting action), expert appointment letters

e) Evaluation Monitoring and reviews

The indicative budget for evaluation of proposals is EUR 1 600 000 while the budget for the monitoring, reviewing and auditing of projects is foreseen to be EUR 2 310 000.

Funding scheme: expert appointment letters

IV. BUDGET

Theme 5 – Energy: Indicative budget⁴²

Call/ activity	DG RTD EUR million	DG ENER EUR million
FP7-ENERGY-2013-1	105.5	
FP7-ENERGY-2013-2		83
FP7-SMARTCITIES-2013	24	90
FP7-ENERGY-2013-IRP	37.5	
FP7-ERANET-2013-RTD ⁴³	22	5
FP7-OCEAN-2013 ⁴⁴	4	
General Activities (see Annex 4)	1.82	2.5
Other actions:		
• Evaluations	1.0	0.6
• Monitoring, reviews and audits	0.66	1.65
• Contribution to IEA IAs	0.05	0.25
• External expertise	0.1	
• Call for tender		1
• Grant to named beneficiary	1.38	
Total Other actions	3.19	3.5
Estimated total budget allocation	198.01	184

⁴² Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority. The Budget figures given in this table are rounded to two decimals points.

⁴³ For further details concerning the implementation of the ERA-NET and ERA-NET Plus calls see Annex 4 of the Cooperation work programme.

⁴⁴ The call fiche with all relevant information can be found in the Work programme of Theme 2 (Food, Agriculture, Fisheries and Biotechnology) as well as on the Participant Portal under the call page FP7-OCEAN-2013

Summary of budget allocation to general activities for 2013 (cf. Annex 4):

	DG RTD EUR	DG ENER EUR
CORDIS	284 843	274 739
Eureka/Research Organisations	14 422	13 911
COST	1 515 740	2 211 546
Experts	3 606	3 478
Total	1 818 611	2 503 674

All budgetary figures given in this work programme are indicative. The final budgets may vary following the evaluation of proposals.

The final budget awarded to actions implemented through calls for proposals may vary:

- The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

For actions not implemented through calls for proposals:

- The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions;
- The final budget awarded for all other actions not implemented through calls for proposals may vary by up to 10% of the indicated budget for these actions.

V. COMPLEMENTARY INFORMATION

Evaluation criteria for the Integrated Research Programmes between research performers on innovative research in support of the SET Plan Research and Innovation Agenda

1. Scientific and/or technological (S/T) excellence

- Soundness of concept and quality of objectives
- Progress beyond the state-of-the-art
- Quality and effectiveness of the S/T methodology and associated work plan

2. Quality and efficiency of the implementation and the management

- Appropriateness of the management structure and procedures
- Quality and relevant experience of the individual participants
- Quality of the consortium as a whole (including complementarity, balance, critical mass etc.).
- Appropriateness of the allocation and justification of the resources to be committed (staff, equipments etc.)

3. Potential impact through the development, dissemination and use of project results

- Contribution to the expected impacts listed in the work programme under the relevant topic.
- Appropriateness of measures for the dissemination and/or exploitation of project results and management of the intellectual property.

Notes:

- Evaluation scores will be awarded for each of the three criteria, and not for the sub-criteria. Each criterion will be scored out of 5. No weightings will apply. The threshold for individual criteria will be 3. The overall threshold, applying to the sum of the three individual scores, will be 10.
- The second criterion corresponds to the selection criteria in the meaning of Article 115 of the Financial Regulations applicable to the general budget of the EU (OJ L248 16.9.2002, p.1). It will be the basis for assessing the 'operational capacity' of participants. The remaining criteria and sub-criteria correspond to the award criteria.

WORK PROGRAMME 2013

COOPERATION

THEME 6

ENVIRONMENT (INCLUDING CLIMATE CHANGE)

(European Commission C(2012) 4536 of 09 July 2012)

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Objective

The objective of the Environment (including climate change) Theme is the sustainable management of the environment and its resources through advancing our knowledge of the interactions between the climate, biosphere, ecosystems and human activities, and developing new technologies, tools and services, in order to address in an integrated way global environmental issues. Emphasis will be put on prediction of climate, ecological, earth and ocean systems changes, on tools and on technologies for monitoring, prevention, mitigation of and adaptation to environmental pressures and risks including on health, as well as for the sustainability of the natural and man-made environment.

I Context

Political Landscape

Against the backdrop of the current economic situation and increased global competition, the Union has defined a strategy to support growth and job creation, Europe 2020¹. The Innovation Union Flagship² initiative supports this strategy through specific commitments. Research and innovation are key drivers of competitiveness, jobs, sustainable growth and social progress.

The work programme 2013 is aligned with, and contributes towards, the objectives of Europe 2020, the Flagship Initiatives 'Innovation Union' and 'A Resource Efficient Europe'³, and other EU policies. There is a determined focus on fostering new ideas, supporting world class teams tackling significant societal challenges, and on ensuring that the fruits of our investments can be properly exploited.

In this way the work programme provides for a smooth transition towards the new research and innovation programme for 2014-2020, Horizon 2020⁴.

Approach for 2013

Under the heading 'Transformative and Responsible Innovation', the 2013 Environment (including climate change) work programme addresses three specific objectives:

- addressing major societal challenges;
- developing and strengthening European leadership in environmental innovation; and
- promoting and facilitating knowledge transfer, assessment, uptake and exploitation of research and innovation data and results in policy, industry and society.

These objectives will be met under five key challenges which cut across the 11 sub-activities defined in the Specific Programme: Coping with climate change; Sustainable use and

¹ Commission Communication 'Europe 2020. A strategy for smart, sustainable and inclusive growth', COM(2010) 2020 final of 3.3.2010.

² Commission Communication 'Europe 2020 Flagship Initiative. Innovation Union', COM(2010) 546 final of 6.10.2010.

³ Commission Communication 'A resource-efficient Europe — Flagship initiative under the Europe 2020 Strategy', COM(2011) 21 final of 26.1.2011.

⁴ Commission Communication 'Horizon 2020 - The Framework Programme for Research and Innovation', COM(2011) 808 final of 30.11.2011

management of land and seas; Improved resource efficiency; Protecting citizens from environmental hazards; and Mobilising environmental knowledge for policy, industry and society. To address these objectives, broader topics going beyond the limits of individual sub-activities as set out in the Specific Programme, have been defined.

In addition, this work programme contributes to the following overarching cross-thematic priorities:

- **Oceans of the future:**

The following topics are part of a cross-thematic call:

- OCEAN 2013.1 'Biosensors for real-time monitoring of biohazard and man-made chemical contaminants in the marine environment'
- OCEAN 2013.2 'Innovative multifunctional sensors for in situ monitoring of marine environment and related maritime activities'.

The following topics also contribute to this strategic agenda:

- ENV.2013.6.1-1 'Climate-related ocean processes and combined impacts of multiple stressors on the marine environment'
- ENV.2013.6.2-8 'Sustainable management of Europe's deep sea and sub-sea floor resources'.

- **Water:**

The following topics make a major contribution to the strategic agenda and will also contribute to the aims of the proposed European Innovation Partnership 'Water' as well as the forthcoming Blueprint to Safeguard Europe's Water Resources:

- ENV.2013.WATER INNO&DEMO-1 'Water innovation demonstration projects'
- ENV.2013.WATER INNO&DEMO-2 'Ensuring the integration of water and innovation demonstration projects and support to trans-national networks of procurers'.

The following topics also contribute to this strategic agenda:

- ENV.2013.6.2-1 'Water resources management under complex, multi-stressor conditions'
- ENV.2013.6.2-2 'Toxicants, environmental pollutants and land and water resources management'
- ENV.2013.6.3-3 'Contribution to the assessment of global water resources through the use of new Earth Observation datasets and techniques'.

- **Raw materials:**

The following topic makes a major contribution to the strategic agenda and will also contribute to the aims of the proposed European Innovation Partnership 'Raw Materials':

- ENV.2013.6.3-1 'Turning waste into a resource through innovative technologies, processes and services'

The following topics address related issues relevant to this priority:

- ENV.2013.6.2-3 'Transition to sustainable, low carbon societies'
- ENV.2013.6.2-8 'Sustainable management of Europe's deep sea and sub-sea floor resources'

- ENV.2013.6.3-2 'Eco-innovative demonstration projects'
- ENV.2013.6.5-2 'Mobilising environmental knowledge for policy and society', sub-topic d) 'Raising societal awareness and tackling skill shortages on raw materials'.

- **Smart cities:**

The following topics address related issues relevant to this priority:

- ENV.2013.6.2-3 'Transition to sustainable, low carbon societies'
- ENV.2013.WATER INNO&DEMO-1 'Water innovation demonstration projects'
- EeB.ENV.2013.6.3-4 'Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts'
- ENV.2013.6.4-2 'Closing gaps of knowledge and reducing exposure to electromagnetic fields (EMF)'
- ENV.2013.6.5-2 'Mobilising environmental knowledge for policy and society', sub-topic e) 'Implications of socio-economic research on air pollution policy'.

- **Secure, clean and efficient energy:**

The following topics address related issues relevant to this priority:

- ENV.2013.6.2-3 'Transition to sustainable, low carbon societies'
- EeB.ENV.2013.6.3-4 'Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts'
- ENV.2013.6.4-4 'Towards stress tests for critical infrastructures against natural hazards'
- ENV.2013.6.5-2 'Mobilising environmental knowledge for policy and society', sub-topic a) 'Policy and economic implications of the post-2012 climate agreements'.

- **Bio-resource efficiency:**

The following topics address related issues relevant to this priority:

- ENV.2013.6.1-4 'Land cover and land-use change and climate change mitigation'
- ENV.2013.6.1-5 'Quantification of consumption-based emissions of greenhouse gases and assessment of policy options'
- ENV.2013.6.2-3 'Transition to sustainable, low carbon societies'
- ENV.2013.6.2-4 'Sustainable land care in Europe'
- ENV.2013.6.2-6 'Improved monitoring of the impact of cultivation on the environment using global Earth Observations'
- ENV.2013.6.5-1 'Accelerating progress towards the Green Economy', sub-topic c) 'Business practices for promoting the 'Green Economy' and sustainable production and consumption post Rio+20'.

a) Innovation Dimension of the activities and bridging towards Horizon 2020

This work programme contains innovation measures in support of activities closer to market such as:

- Support to market-uptake, notably through activities aimed at generating knowledge to deliver new and more innovative products, processes and services.

This includes activities such as prototyping, testing, demonstrating, knowledge transfer, proof of concept, as mentioned in the following topics:

- ENV.2013.6.2-4 Sustainable land care in Europe,
- ENV.2013.6.2-8 Sustainable management of Europe's deep sea and sub-sea floor resources,
- OCEAN 2013.1 Biosensors for real-time monitoring of biohazard and man-made chemical contaminants in the marine environment,
- OCEAN 2013.2 Innovative multifunctional sensors for in situ monitoring of marine environment and related maritime activities,
- ENV.2013.6.3-1 Turning waste into a resource through innovative technologies, processes and services,
- ENV.2013.6.3-2 Eco-innovative demonstration projects, and
- ENV.2013.WATER INNO&DEMO-1 Water innovation demonstration projects.

Activities addressing exploitation of existing research results include the following topics:

- ENV.2013.6.3-2 Eco-innovative demonstration projects,
- EeB.ENV.2013.6.3-4 Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts,
- ENV.2013.6.5-1 Accelerating progress towards the Green Economy,
- ENV.2013.6.5-2 Mobilising environmental knowledge for policy and society, sub-topic,
- ENV.2013.6.5-3 Exploiting the European Open Data Strategy to mobilise the use of environmental data and information
- ENV.2013.6.5-4 Knowledge platforms, networking and uptake of research results for strengthened international R&I cooperation.

Innovation is also encouraged by supporting demand-side measures such as pre-commercial procurement (notably via topic ENV.2013.WATER INNO&DEMO-2 'Ensuring the integration of water and innovation demonstration projects and support to trans-national networks of procurers').

Industrial participation is encouraged particularly in the following topics:

- ENV.2013.6.2-4 Sustainable land care in Europe,
- ENV.2013.6.2-8 Sustainable management of Europe's deep sea and sub-sea floor resources,
- OCEAN 2013.1 Biosensors for real-time monitoring of biohazard and manmade contaminants in the marine environment,
- OCEAN 2013.2 Innovative multifunctional sensors for in situ monitoring of marine environment and related maritime activities,
- ENV.2013.6.3-1 Turning waste into a resource through innovative technologies, processes and services,

- ENV.2013.6.3-2 Eco-innovative demonstration projects, and
- EeB.ENV.2013.6.3-4 Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts.

Other user engagement is encouraged particularly in topics:

- ENV.2013.6.2-3 Transition to sustainable, low carbon societies,
- ENV.2013.6.2-5 Urban biodiversity and green infrastructure,
- ENV.2013.6.2-7 Development of advanced technologies and tools for mapping, diagnosing, protecting and managing cultural landscapes in rural areas
- OCEAN 2013.2 Innovative multifunctional sensors for in situ monitoring of marine environment and related maritime activities, and
- ENV.2013.WATER INNO&DEMO-1 Water innovation demonstration projects,
- EeB.ENV.2013.6.3-4 Energy efficient retrofitting and renewal of existing buildings for sustainable urban neighbourhoods,
- ENV.2013.6.5-1 Accelerating progress towards the Green Economy,
- ENV.2013.6.5-2 Mobilising environmental knowledge for policy and society, sub-topic f) Designing environmental research and innovation for solutions and uptake of results in the Danube macro region
- ENV.2013.6.5-4 Knowledge platforms, networking and uptake of research results for strengthened international R&I cooperation
- ENV.2013.6.5-5 Network for forward looking activities and assessment of research and innovation prospects.

The focus on innovation is reflected in the description of the objectives and scope of the specific topics, as well as in the expected impact statements. The innovation dimension of the proposals will be evaluated under the 'Impact' evaluation criterion.

- Support to broader aspects of innovation includes:
 - topics aimed at fostering service, process and/or organisational innovation, for example:
 - ENV.2013.6.3-1 Turning waste into a resource through innovative technologies, processes and services,
 - ENV.2013.6.3-2 Eco-innovative demonstration projects,
 - ENV.2013.WATER INNO&DEMO-1 Water innovation demonstration projects,
 - ENV.2013.6.5-2 Mobilising environmental knowledge for policy and society, sub-topic c) Empowering international economic development through the use of environmental Earth Observations,
 - ENV.2013.6.5-3 Exploiting the European Open Data Strategy to mobilise the use of environmental data and information;
 - topics with a component on social innovation, for example topics:
 - ENV.2013.6.2-3 Transition to sustainable, low-carbon societies,
 - ENV.2013.6.2-5 Urban biodiversity and green infrastructure.
- Support to new approaches stimulating innovation, notably through support to European Innovation Partnerships:
 - topic ENV.2013.WATER INNO&DEMO-1 Water innovation demonstration projects,

ENV.2013.WATER INNO&DEMO-2 Ensuring the integration of water and innovation demonstration projects and support to trans-national networks of procurers,

ENV.2013.6.3-1 Turning waste into a resource through innovative technologies, processes and services, and

ENV.2013.6.5-2 Mobilising environmental knowledge for policy and society, sub-topic d) Raising societal awareness and tackling skill shortages on raw materials.

b) SME relevant research

Participation of SMEs has strongly been encouraged in the FP7 Environment (including climate change) Theme. Since the start of FP7, almost 11.8 % of participants in the FP7 Environment (including climate change) Theme have been SMEs, receiving around 9.4 % of the total budget⁵.

Efforts have been made to encourage SME participation notably through SME targeted topics and bottom-up approaches, together with demonstration actions, where SMEs can follow up research projects with work linked to 'demonstration' or production of prototypes before actually commercialising goods and services.

As an outcome of the 2013 work programme, an increase in SME participation to 15 % in 2013 is expected.

- Topics with mandatory levels of SME participation and ring-fenced SME budgets include:
 - ENV.2013.6.2-2 Toxicants, environmental pollutants and land and water resources management,
 - ENV.2013.6.2-4 Sustainable land care in Europe,
 - ENV.2013.6.2-5 Urban biodiversity and green infrastructure,
 - ENV.2013.6.2-6 Improved monitoring of the impact of cultivation on the environment using global Earth Observations,
 - ENV.2013.6.2-7 Development of advanced technologies and tools for mapping, diagnosing, protecting and managing cultural landscapes in rural areas,
 - ENV.2013.6.2-8 Sustainable management of Europe's deep sea and sub-sea floor resources,
 - OCEAN 2013.1 Biosensors for real-time monitoring of biohazard and manmade contaminants in the marine environment,
 - OCEAN 2013.2 Innovative multifunctional sensors for in situ monitoring of marine environment and related maritime activities,
 - ENV.2013.6.3-1 Turning waste into a resource through innovative technologies, processes and services,
 - ENV.2013.6.3-2 Eco-innovative demonstration projects,
 - ENV.2013.6.3-3 Contribution to the assessment of global water resources through the use of new Earth Observation datasets and techniques,
 - ENV.2013.WATER INNO&DEMO-1 Water innovation demonstration projects,

⁵ Figures refer to 2007-2011, source: 'Eighth Progress Report on SMEs' Participation in FP7' (http://ec.europa.eu/research/sme-techweb/pdf/sme_participaton_in_fp7_2007_2011_full_report.pdf)

- EeB.ENV.2013.6.3-4 Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts,
- ENV.2013.6.5-3 Exploiting the European Open Data Strategy to mobilise the use of environmental data and information.

c) Strengthening the European Research Area

The following topics will particularly contribute towards strengthening the European Research Area:

- ENV.2013.6.2-8 'Sustainable management of Europe's deep sea and sub-sea floor resources'
- ENV.2013.6.3-1 'Turning waste into a resource through innovative technologies, processes and services'
- ENV.2013.WATER INNO&DEMO-1 'Water innovation demonstration projects'
- ENV.2013.WATER INNO&DEMO-2 'Ensuring the integration of water and innovation demonstration projects and support to trans-national networks of procurers'
- ENV.2013.6.4-1 'Assessing individual exposure to environmental stressors and predicting health outcomes: paving the way for an EU-wide assessment'
- ENV.2013.6.5-2 'Mobilising environmental knowledge for policy and society', sub-topic d) 'Raising societal awareness and tackling skill shortages on raw materials'
- ENV.2013.6.5-2 'Mobilising environmental knowledge for policy and society', sub-topic f) 'Designing environmental research and innovation for solutions and uptake of results in the Danube macro region'
- ENV.2013.6.5-3 'Exploiting the European Open Data Strategy to mobilise the use of environmental data and information'
- ENV.2013.6.5-4 'Knowledge platforms, networking and uptake of research results for more strategic international R&I cooperation'
- ENV.2013.6.5-6 'ERA-NET Plus action: Development of new methodologies, technologies and products for the assessment, protection and management of historical and modern artefacts, buildings and sites'.

d) Dissemination actions

Dissemination activities are addressed throughout the work programme. Each proposal should allocate appropriate efforts and resources for dissemination to promote the use and uptake of results.

Topics with a specific focus on dissemination, knowledge transfer and public engagement include:

- ENV.2013.6.2-5 Urban biodiversity and green infrastructure,
- ENV.2013.6.2-6 Improved monitoring of the impact of cultivation on the environment using global Earth Observations,
- OCEAN 2013.2 Innovative multifunctional sensors for in situ monitoring of marine environment and related maritime activities,
- ENV.2013.WATER INNO&DEMO-1 Water innovation demonstration projects,

- all of the topics under Challenge 6.5 'Mobilising environmental knowledge for policy, industry and society'.

Open access in FP7: Beneficiaries funded partially or entirely by the Cooperation Programme under the Environment (including climate change) Theme are required to deposit peer-reviewed articles resulting from projects in an institutional or subject-based repository, and to make their best efforts to ensure that readers have open access to these articles within six months of publication.

e) Overall expected impact

It is expected that through its research and innovation actions the 2013 work programme will address the major societal challenges of coping with climate change and protecting citizens from environmental hazards. It will also boost European competitiveness by developing and strengthening European leadership in environmental innovation, notably by promoting novel applications and tools for improved resource efficiency of natural resources (e.g. water, land, marine), covering both technological and socio-economic innovation. Furthermore, the 2013 work programme will promote and facilitate knowledge transfer, assessment, uptake and exploitation of environmental research and innovation data and results by policy makers, industry and society. In addition, the results obtained will provide support for evidence-based decision-making, notably for EU policies in the field of environment and climate, e.g. soil, water, chemicals, disaster reduction, mitigation and adaptation, and support EU initiatives on climate action, resource efficiency and eco-innovation. In order to enhance the overall impact, the Commission may during the negotiation phase propose establishing coordination or clustering mechanisms between projects selected under these calls as well as with on-going projects in the given fields.

International Cooperation

International cooperation continues to be an integral part of the Environment Theme throughout the work programme and all topics are open for participants from the International Cooperation Partner Countries (ICPC). The strategic approach for international cooperation of EU environmental research includes annual identification of major cooperation countries and/or regions. Efforts will focus on actions that reflect the overarching messages and objectives of Rio+20 and the recent Durban outcome: green economy and sustainable development, paying attention to the Millennium Development Goals and strengthened international climate action. Regional networking for clustering of projects, uptake of research results and knowledge platforms will aim to enhance the scope of future cooperation with Latin America, ASEAN, Mediterranean, Black Sea and North Atlantic third countries. Other issues with international components include climate change (in particular for the Arctic, oceans and atmosphere), natural disasters (Japan and Asia) and GEO capacity building. Contributions to multilateral initiatives such as IPCC and GEO will continue.

Topics requiring or benefitting from the involvement of non-EU partners include:

- all topics under Challenge 6.1 'Coping with Climate Change',
- ENV.2013.6.2-6 Improved monitoring of the impact of cultivation on the environment using global Earth Observations,
- ENV.2013.6.3-3 Contribution to the assessment of global water resources through the use of new Earth Observation datasets and techniques,
- ENV.2013.6.4-3 Coasts at threat in Europe: tsunamis and climate-related risks,

- ENV.2013.6.5-1 Accelerating progress towards the Green Economy,
- ENV.2013.6.5-4 Knowledge platforms, networking and uptake of research results for strengthened international R&I cooperation.

Cross-thematic approaches

Special attention will be paid to cross-cutting marine and maritime research with the launch of a new cross-thematic call 'The Ocean of Tomorrow: joining research forces to meet challenges in ocean management'. It will be implemented jointly between Theme 2 Food, Agriculture, Fisheries and Biotechnologies (FAFB), Theme 4 Nanosciences, Nanotechnologies, Materials and New Production Technologies, Theme 5 Energy, Theme 6 Environment (including climate change), and Theme 7 Transport (including aeronautics). The main objective of the call is to promote research and innovation on marine technologies, in particular sensors, anti-biofouling materials, and innovative transport and deployment systems for the offshore energy sector. The topics and funding mechanisms will allow for large, multidisciplinary and multi-stakeholder topics with an appropriate balance between (basic/applied) research, knowledge transfer and demonstration, and to support a number of specific EU policies. The four topics are published in the Work Programmes of all participating Themes, as a cross-thematic call. 'The Ocean of Tomorrow' call (FP7-OCEAN-2013) is subject to a separate call fiche.

A topic is launched in the context of the Public-Private Partnership 'Energy Efficient Buildings': EeB.ENV.2013.6.3-4 'Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts, implemented in cooperation with Theme 4 Nanosciences, Nanotechnologies, Materials and New Production Technologies and Theme 6 Environment (including climate change).

Cross-thematic approaches are also foreseen within this work programme to support actions on:

- raw materials, i.e. the topics ENV.2013.6.2-8 'Sustainable management of Europe's deep sea and sub-sea floor resources', ENV.2013.6.3-1 'Turning waste into a resource through innovative technologies, processes and services' and ENV.2013.6.5-2 'Mobilising environmental knowledge for policy and society', sub-topic d) 'Raising societal awareness and tackling skill shortages on raw materials'⁶;
- security and EURATOM, i.e. the topic ENV.2013.6.4-4 'Towards stress tests for critical infrastructures against natural hazards'⁷;
- socio-economic sciences, i.e. the topic ENV.2013.6.2-3 'Transition to sustainable, low-carbon societies'⁸.

Moreover, due to the nature of the tasks required, the following topics would benefit from the inclusion of participants from socio-economic science disciplines:

⁶ These topics complement actions to be supported under the Theme 4 Nanosciences, Nanotechnologies, Materials and New Production Technologies.

⁷ Co-ordination with related actions under the EURATOM programme and the Theme 10 Security.

⁸ Co-ordination with projects selected under the Theme 8 Socio-economic Sciences and Humanities work programme topic SSH.2013.2.1-1 'Obstacles and prospects for sustainable lifestyles and green economy in Europe'.

- ENV.2013.6.1-1 Climate-related ocean processes and combined impacts of multiple stressors on the marine environment,
- ENV.2013.6.1-3 Impacts of higher-end scenarios (global average warming > 2 °C with respect to pre-industrial level),
- ENV.2013.6.1-5 Quantification of consumption-based emissions of greenhouse gases and assessment of policy options,
- ENV.2013.6.1-6 Economics of adaptation to climate-change,
- ENV.2013.6.2-3 Transition to sustainable, low-carbon societies,
- ENV.2013.6.2-5 Urban biodiversity and green infrastructure,
- ENV.2013.6.3-1 Turning waste into a resource through innovative technologies, processes and services,
- ENV.2013.6.3-2 Eco-innovative demonstration projects,
- ENV.2013.WATER INNO&DEMO-1 Water innovation demonstration projects,
- ENV.2013.WATER INNO&DEMO-2 Ensuring the integration of water and innovation demonstration projects and support to trans-national networks of procurers,
- EeB.ENV.2013.6.3-4 Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts,
- ENV.2013.6.4-3 Coasts at threat in Europe: tsunamis and climate-related risks,
- ENV.2013.6.5-1 Accelerating progress towards the Green Economy,
- ENV.2013.6.5-2 Mobilising environmental knowledge for policy and society,
- ENV.2013.6.5-3 Exploiting the European Open Data Strategy to mobilise the use of environmental data and information,
- ENV.2013.6.5-5 Network for forward looking activities and assessment on research and innovation prospects.

Theme specific information

The budget of the 2013 work programme is divided into challenges with separate indicative budgets. The work programme 2013 is implemented through a range of funding schemes. The type of funding scheme used and specific features, e.g. SME participation, are described in the topic descriptions in section II and also in section III. For each funding scheme there are upper limits on the requested EU contribution (for details please see the topic descriptions in section II and general call information in section III). **Funding limits will be strictly applied as eligibility criteria. Proposals that do not respect this limit will be considered ineligible.**

The minimum number of applicants in funding schemes is specified in section III of this work programme. The duration of the project and the requested EU contribution should be in line with a realistic planning of the project. The budget request should also be in line with the needs of the consortia, within the maximum EU contribution, but not necessarily at it.

Usage of Earth Observation data: In the context of cooperation with the European Space Agency (ESA), projects selected for funding are encouraged to utilise ESA Earth Science data. The data, both from ESA missions or third party missions, are for the vast majority of cases available for free web download (further details for ESA missions and Third Party Missions are available at <http://eopi.esa.int>). Likewise, the utilisation of data produced from different initiatives of ESA or the European Commission, in particular Global Monitoring for Environment and Security (GMES), is encouraged in all activities of the Environment Theme.

(Further details on space data in the context of GMES are available at <http://gmesdata.esa.int/web/gsc/home>).

Gender dimension: The pursuit of scientific knowledge and its technical application towards society requires the talent, perspectives and insight that can only be assured by increasing diversity in the research workforce. Therefore, all projects are encouraged to have a balanced participation of women and men in their research activities and to raise awareness on combating gender prejudices and stereotypes. When human beings are involved as users, gender differences may exist. These will be addressed as an integral part of the research to ensure the highest level of scientific quality. In addition, specific actions to promote gender equality in research can be financed as part of the proposal, as specified in Appendix 7 of the Negotiation Guidance Notes⁹.

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http://ec.europa.eu/research/participants/portal/ShowDoc/Extensions+Repository/General+Documentation/Guidance+documents+for+FP7/Negotiations+and+amendments/negotiation_en.pdf

II CONTENT OF CALLS

Challenge 6.1 Coping with climate change

Indicative budget: EUR 80 million

In the light of cautionary evidence coming from Earth Observations and the high trends in global greenhouse gas emissions, research will on the one hand focus on reducing key uncertainties linked to the functioning of the earth-climate system and quantification of climate change impacts, and on the other hand explore the potential of adequate mitigation and adaptation policies to contribute to the Roadmap for moving to a competitive low carbon economy in 2050¹⁰. In particular, research will address the fundamental processes that couple land surface, atmosphere, ice-caps and oceans as well as the cumulative effects of climatic and non-climatic stressors on marine geochemistry and biodiversity. Moreover, research will further explore atmospheric processes and pollutants, spanning the stratosphere and lower troposphere and their impact on climate change and land ecosystems. Research and innovation will contribute to better quantification of impacts associated with high-end scenarios (> 2 °C) in order to inform policy makers of risks, opportunities, costs and benefits linked to different adaptation and mitigation pathways, their synergies and trade-offs. In this context, issues related to climate change and land use, land use change and associated GHG emission monitoring, reporting and verification will also be explored. Specific support to climate policies is also provided through dedicated actions on the quantification of consumption-based emissions and the development of methodologies for estimating adaptation costs at various scales. The participation of non-EU partners in all research proposals may bring added value due to the global nature of climate change research. Within this global context, projects may also consider addressing those parts of the globe — beyond geographical Europe — which may be more affected by climate change and by its consequences, such as polar areas, small island states or European outermost regions where relevant.

ENV.2013.6.1-1 Climate-related ocean processes and combined impacts of multiple stressors on the marine environment – FP7-ENV-2013-two-stage

Oceans play a key role in regulating the climate system. Moreover, marine processes and ecosystems are sensitive to climate change and other stressors. Synergies, combination and feedbacks of single pressures on the marine environment may result in amplified impacts. Under a comprehensive multi-forcing assessment, regional and global scale modelling capabilities, laboratory and field experiments and observation systems should be combined to enhance specific knowledge on key marine-climate research issues, such as:

- relevant climate-related physical-chemical ocean processes and dynamics, including coupled ocean-atmosphere mechanisms, stratification, thermohaline circulation, interaction with the cryosphere;

¹⁰ Commission Communication 'A Roadmap for moving to a competitive low carbon economy in 2050', COM(2011) 112 final of 8.3.2011.

- cumulative impacts and feedbacks of greenhouse gases increase — leading in particular to warming, acidification and deoxygenation — and non-climatic stressors (such as overfishing, pollution, etc.) on marine biogeochemistry, ecological communities, biodiversity, ecosystems and ecosystem services;
- assessment of socio-economic vulnerabilities and evaluation of how potential climate-driven physical and biological changes may affect relevant economic activities and human welfare.

Acknowledging that processes and impacts may be diversified and exacerbated in different regions, like the Arctic, proposals may address different processes and impacts, and may focus on different geographical areas, depending on their specific relevance to the key research challenges.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 9 000 000.

One or more proposals can be selected.

Expected impact: Improved climate predictions and more accurate quantification of climate change impacts on oceans, marine ecosystems and services through the reduction of uncertainties. Improved EU and international policies aimed at protecting the marine environment and safeguarding it as a living resource for human communities, and more effective policy and management options for societal responses to climate change.

Specific feature: Projects selected under this topic will be linked through a coordination mechanism that will be defined during the negotiation stage. Costs of this coordination will be covered by project resources.

ENV.2013.6.1-2 Atmospheric processes, eco-systems and climate change – FP7-ENV-2013-two-stage

At all levels, from the lower troposphere to the stratosphere, natural and anthropogenic emissions initiate or affect atmospheric processes which interact, also through feedback mechanisms, with ecosystems and climate. Studies should integrate data from in situ measurements, from space observations and modelling. Large-scale field experiments may be accomplished where appropriate. Research should focus on improving the understanding of key processes, such as:

- at land surface/lower troposphere level, the interaction and feed-backs between atmospheric pollutants (such as ozone and the corresponding precursors), climate change and land ecosystems (in particular vegetation and forests);
- at different levels of the troposphere, the formation and properties of clouds related to biogenic (such as VOCs) and anthropogenic emissions (such as those from aviation and maritime transport) and their climate forcing; and
- at stratospheric level, the causes and expected evolution of ozone depletion over the Arctic region including the coupling between stratospheric processes and climate change and its feedbacks.

Acknowledging that the above-mentioned subjects require fairly different instrumental, observational and modelling capabilities, proposals under this topic may focus on addressing specific atmospheric processes, and may focus on different geographical areas, depending on their specific relevance to the key research challenges.

Proposals should improve the representation of these processes in relevant models and the assessments of socio-economic implications.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 9 000 000.

One or more proposals can be selected.

Expected impact: Significant reduction of uncertainties of current state-of-the-art climate predictions at different scales leading to improved EU and international policies aimed at better protecting human and ecosystem health.

Specific feature: Projects selected under this topic, if addressing related subjects, will be linked through a coordination mechanism that will be defined during the negotiation stage. Costs of this coordination will be covered by project resources.

ENV.2013.6.1-3 Impacts of higher-end scenarios (global average warming > 2 °C with respect to pre-industrial level) – FP7-ENV-2013-two-stage

Current observations and trends show a growth of greenhouse gases emissions which dangerously approach higher-end scenarios leading to a projected average global temperature rise higher than the 2 °C target set by the Copenhagen Accord¹¹ and confirmed in Durban¹². A better quantification of impacts and vulnerabilities associated with a range of high-end scenarios is therefore needed in order to inform policy and decision makers of the social and economic risks, opportunities, costs and benefits linked to different adaptation and mitigation pathways — also in relation to tipping points —, their synergies and trade-offs, while appropriately recognizing the inherent uncertainties in long-term projections. Proposals should duly consider recent achievements made in the fields of socio-economic and representative concentration pathways (RCP). For a range of RCPs (leading to high-end, intermediate and 2 °C warming levels) research should assess and compare impacts, vulnerabilities and adaptation options for key economic, social and environmental sectors as well as analyse economy-wide implications. The research should cover different scales — from global to local/regional — and address the time- and path-dependence of adaptation options under the different scenarios.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 9 000 000.

One or more proposals can be selected.

Expected impact: Innovative and effective mitigation and adaptation strategies and measures that would address multiple national, regional, or global priorities and stakeholders in key economic and social sectors. Assisting the EU in the development and implementation process of international climate agreements via a better quantification of impacts and vulnerabilities. By reducing uncertainties in long-term projections of climate change impacts, improved assessment of the risks, social and economic costs and opportunities of adaptation and mitigation options.

Specific feature: Projects selected under this topic will be linked through a coordination mechanism that will be defined during the negotiation stage. Costs of this coordination will be covered by project resources.

ENV.2013.6.1-4 Land cover and land-use change and climate change mitigation – FP7-ENV-2013-two-stage

Changes in land-use/land cover and land management practices affect the sources and sinks of greenhouse gases and may alter key physical and biochemical properties and processes (e.g. planetary albedo, energy balance, water and nutrient cycles) and thus have an important impact on climate. Research should quantify the net climate effects of major (past and future)

¹¹ UNFCCC Draft decision -/CP.15, Copenhagen Accord, FCCC/CP/2009/L.7.

¹² Decision -/CMP.7 of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.

land cover and land use changes (both direct and indirect) in a global context in order to better assess their mitigation potential. Research should also improve the representation of land cover and land use change in global climate models, evaluate model performance and uncertainty, confront models with Earth Observation data and develop common metrics for evaluation. The interplay with climate change adaptation should also be explored. Other important drivers such as energy security, water availability and food production and their interplay with climate change also need to be considered at regional and global level in order to establish an integrated assessment approach in developing scenarios, exploring risks, opportunities, trade-offs, calculating costs/gains and taking into account ecosystem services. Furthermore there is a need to further improve the methodologies concerning monitoring, reporting and verification (MRV) including a quantitative and comparative assessment of land-use classification data sources.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 6 000 000.

One or more proposals can be selected.

Expected impact: Input to the design, assessment and implementation of European and international policies related to land use changes and climate change mitigation through more accurate models and methodologies. Support the development of good practice guidelines regarding monitoring, reporting and verification (MRV) also with reference to indirect land use change (ILUC) criteria.

Specific feature: Projects selected under this topic will be linked through a coordination mechanism that will be defined during the negotiation stage. Costs of this coordination will be covered by project resources.

ENV.2013.6.1-5 Quantification of consumption-based emissions of greenhouse gases and assessment of policy options – FP7-ENV-2013-two-stage

In the face of growing human population and increased levels of consumers' income worldwide, and particularly in emerging economies, unchanged global trends in consumption of goods and services are projected to encourage an accelerated increase in aggregate greenhouse gases emission levels, reducing the likelihood of keeping global average temperature increase below 2 °C with respect to pre-industrial levels. It is therefore necessary to complement existing domestic greenhouse gases (GHG) emission reduction efforts with adequate policy instruments that address the influence of consumption patterns on both national and global GHG emission levels and trends. There is a need to develop further analytical tools (e.g. conceptual frameworks, economic models, accounting methods, behavioural economics) to better quantify global emissions related to consumption of goods and services, fully understand the drivers of upward trends and identify demand-side tools and policies that can trigger, over the short-, medium- and long-term, a change in consumption patterns towards a low-carbon future. In a context of an increasingly globalised world, research activities will also explore the transformations in the international flows of trade, investments, technology transfer and diffusion of innovation associated with consumption-based emission pathways, and the related policy implications. Feasibility and effectiveness of possible domestic and international measures aimed at reducing overall consumption-based emissions should be assessed. Proper treatment of uncertainty has to be associated with quantification methodologies. Limitations in data availability also need to be addressed through appropriate proxies.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 3 000 000.

Up to one proposal can be selected.

Expected impact: Stimulation of innovative European and international climate policies and services due to the improved shared knowledge base on consumption emissions. More effective policy mix for achieving the objectives of the EU Climate and Energy package¹³ and the Roadmap for moving to a competitive low carbon economy in 2050¹⁴.

ENV.2013.6.1-6 Economics of adaptation to climate-change – FP7-ENV-2013-two-stage

More reliable quantification of the costs of climate-change consequences and assessment of adaptation options is required to further substantiate the economic case for adaptation to climate change. Research will develop and apply new and/or improve existing methodological frameworks for assessing the costs, benefits and effectiveness of climate change adaptation policies and measures in Europe at different levels. Research should focus on the reduction of uncertainties (and cascading uncertainty), increased comparability across different time horizons (short-, medium- and long-term) and geographical scales, better reflection of both monetary and non-monetary costs and benefits of adaptation, and quantification of additional costs of measures/policies due to adaptation to climate change (e.g. for measures/policies that are not solely motivated by the need to adapt to climate change, it is important to be able to better estimate the increase in cost due to climate change as compared to a baseline scenario). Moreover, research should provide methodologies for scaling up information generated and collected at the local level in a bottom-up approach and improve the understanding of the indirect effects of adaptation measures/policies on the overall economy and on growth and jobs.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 3 000 000.

Up to one proposal can be selected.

Expected impact: Support to the European Adaptation Strategy¹⁵ by reducing uncertainties in costing of adaptation to climate change. Provide decision makers and planners at all levels with more reliable estimation of cost and benefits to drive and prioritise adaptation actions. The increased knowledge base will improve the prospects for innovative policy making and services in adaptation. Improved understanding of how adaptation can be integrated into planning frameworks and budget cycles, how climate change impacts and adaptation can affect the economy and society at large.

¹³ http://ec.europa.eu/clima/policies/package/index_en.htm

¹⁴ See footnote 10.

¹⁵ White paper — Adapting to climate change: towards a European framework for action COM(2009) 147 final of 1.4.2009.

Challenge 6.2 Sustainable use and management of land and seas

Indicative budget: EUR 88 million (*of which EUR 15 million for the cross-thematic call 'The Ocean of Tomorrow'*)

The challenge is to improve the knowledge base on how ecosystems react to pressures in order to underpin the implementation of the transition phase to resilient, sustainable and resource efficient societies. Research will examine how concepts such as biodiversity offsets and no net loss of biodiversity can contribute to this transition. Research will investigate the potential of Green Infrastructure (including wooded and green areas in the urban environment) and the restoration economy and will deliver integrated governance strategies and tools for land and water resources management under complex, multi-stressor conditions, including emerging pollutants and pollutant mixtures, in line with the relevant EU policies. Innovative solutions will be sought to protect and conserve soil resources through combating land degradation and desertification and through identifying soil compaction. Innovative applications for Earth Observation in land use and ecosystem monitoring will be supported. Research will also address challenges associated with the sustainable exploitation, management and conservation of Europe's deep sea resources. Development of marine technology, notably sensors, will be supported in cooperation with other Themes.

ENV.2013.6.2-1 Water resources management under complex, multi-stressor conditions – FP7-ENV-2013-two-stage

The challenge is to underpin decision making, risk assessment and management of water systems under complex multiple stress conditions (combination of organic and inorganic pollution, flow and morphology alteration, surface and groundwater abstraction, land use change, climate variability and change, invasive species, pathogens, etc.). Research should have a clear user perspective and aim to enhance our understanding of stressors interactions, species interactions, species-stressor-relationships and impacts on the ecological functioning, stability and resilience of the aquatic ecosystems. Based on innovative methodologies, research should develop holistic approaches and tools to diagnose changes in the ecological, quantitative and chemical status of water bodies, as defined in the Water Framework directive (WFD)¹⁶, and in water availability, in relation to multiple stress conditions, identify the relevant stressors which are responsible for their deterioration, and forecast and predict the ecosystem responses and ecological recovery as a consequence of alternative management measures on different spatial scales.

It should also aim at the development of integrated impact assessment tools, coupling biophysical with socio-economic assessment of impacts (provision of ecosystem services) to improve water resource protection and management, including water related extreme event prevention and management, at EU and river basin levels.

Funding Scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 9 000 000.

One or more proposals can be selected.

¹⁶ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, OJ L327, 22.12.2000, p. 1

Expected impact: Improved water status and availability of clean water, better implementation of water policy and optimal decision making in water resources management under complex multiple stress conditions, with the aim of achieving sustainable resource use and flood risk reduction. Development of more cost-effective Programmes of Measures (POMs) to improve the ecological status of surface water bodies from the local to the river basin scale and improve the groundwater body status – also in the context of ecosystem goods and services – in line with the EU Water Framework Directive¹⁷.

Specific feature: Projects selected under this topic will be linked through a coordination mechanism that will be defined during the negotiation stage. Costs of this coordination will be covered by project resources.

ENV.2013.6.2-2 Toxicants, environmental pollutants and land and water resources management – FP7-ENV-2013-two-stage

Mixtures of toxic compounds have been found in most environmental compartments, including soils, sediments and water bodies. In water, attention has focused on the so-called priority substances; the list of these is subject to regular review. There is evidence to suggest that many emerging pollutants, for which a rather limited knowledge base is currently available, may be posing a significant ecological and human health risk through their presence in water bodies. The research should provide a common knowledge base on a wide range of toxicants and other chemicals acting as environmental and in particular aquatic pollutants. It should focus on emerging pollutants (pollutants whose potential risk we are only now becoming aware of) and their metabolites and transformation products as well as their synergistic effects. It should improve our understanding and modelling capacity regarding the sources, transport pathways and transfer times (air, soil, sediments, groundwater and surface waters, including receiving waters, biota) and fate (including degradation, (bio)accumulation, spatial and temporal variability of concentrations in different compartments) of these pollutants as well as regarding the quantification of their environmental impact. It should analyse the implications for the overall assessment of the ecological and human health risks posed by the presence and levels of these substances in the (aquatic) environment in the light of existing information on their inherent toxicity. The research should deliver chemical analysis methods that are sufficiently sensitive to detect and monitor the pollutants at concentrations below their predicted no-effect levels. It should also include the development of effect-based tools (such as biomarkers, bio-indicators and bioassays) for the identification and early detection of pollutants causing harmful ecological impacts (as a step towards linking chemical and ecological status of water) and for assessing the impacts of pollutant mixtures and should deliver methods to quantify impact in situ on a single-organism, population or community level.

Funding Scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 12 000 000.

Up to one proposal can be selected.

Expected impact: Evidence based development of environmental and especially water policies with respect to emerging pollutants and pollutant mixtures through improved knowledge and tools. New knowledge enabling the design of control measures and abatement options, and the assessment of their effectiveness in meeting the environmental objectives of the Water Framework Directive¹⁸. Identification of substances with emissions which might

¹⁷ See footnote 16.

¹⁸ See footnote 16.

require regulation because of the risk posed to or via the aquatic environment, and evidence based reviews of the list of priority substances under the Water Framework Directive. Development of innovative identification and detection tools.

Additional eligibility criteria: Projects will only be selected for funding on the condition that the estimated EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

ENV.2013.6.2-3 Transition to sustainable, low-carbon societies – FP7-ENV-2013-two-stage

Fundamental societal transformations are required in order to move towards sustainable, resource-efficient, low-carbon and climate resilient European societies consistent with the objectives set, amongst others, in the EU's Sustainable Development¹⁹ and Biodiversity²⁰ Strategies, the 'Climate and Energy package (20/20/20 targets)²¹, the Roadmap for moving to a competitive low carbon economy in 2050²² and the Roadmap for a Resource Efficient Europe²³. Research will investigate values, policies and mechanisms behind societal transformation and the knowledge gained from experiences at different scales with such societal transitions and their trajectories. Using an integrated and trans-disciplinary approach, research will identify and analyse in detail the key challenges of the transition to sustainable, low carbon and resource efficient societies (including their interaction and feedbacks). Among the issues that may be taken into consideration are:

- institutional frameworks for innovative environmental governance at multiple scales;
- the potential contribution of local and regional action to European policies;
- the application of market-based mechanisms to new areas, and the use of innovative financing strategies;
- the factors enabling comprehension, behavioural changes, and the acceptance of green, low-carbon technologies and business models;
- the development of new adaptive strategies focused upon sustaining prosperity, well-being, quality of life and the maintenance and enhancement of biodiversity, including through novel concepts of sustainable management; and
- the novel and sustainable exploitation and use of green infrastructure and the development of new strategies for no net loss of biodiversity, ecosystems and their services as a component of the ecosystem approach.

Opportunities for innovation (including social innovation), co-benefits and job creation will be identified and studied to help the private sector, households, communities, local and regional governments respond and adapt to global environmental changes and support the development of green economic strategies in Europe.

Funding Scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 3 000 000.

One or more proposals can be selected.

¹⁹ Commission Communication 'A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development', COM(2001) 264 final of 15.5.2001.

²⁰ Commission Communication 'Our life insurance, our natural capital: an EU biodiversity strategy to 2020', COM(2011) 244 final of 3.5.2011.

²¹ See footnote 133.

²² See footnote 10.

²³ Commission Communication 'Roadmap to a Resource-Efficient Europe', COM(2011) 0571 final of 20.9.2011.

Expected impact: Better implementation of the EU's Sustainable Development and Biodiversity Strategies, the 'Climate and Energy package (20/20/20 targets)' and the Roadmap for moving to a competitive low carbon economy in 2050 through increased understanding of societal transformations processes in the transition to sustainable, low carbon societies. Stimulation of public debate on social innovation and bottom-up approaches. Provision of assessment of options and experiences to policy makers, resulting in improved decision making and increased cost-efficiency of policy response, as well as better understanding of the socio-economic and environmental impact of transition.

Specific feature: Projects selected under this topic will be linked through a coordination mechanism that will be defined during the negotiation stage. Costs of this coordination will be covered by project resources. In addition, these projects will be expected to coordinate their activities with the activities of projects selected under the Socio-economic Sciences and Humanities work programme topic SSH.2013.2.1-1 'Obstacles and prospects for sustainable lifestyles and green economy in Europe'.

ENV.2013.6.2-4 Sustainable land care in Europe – FP7-ENV-2013-two-stage

Taking full stock of existing scientific data and results obtained from relevant EU, international and national funded projects, integrative and interdisciplinary research must fill the knowledge gaps in the understanding of the complexity and functioning of soil systems and their interaction with human activities. Research will support the development of innovative, mitigation and restoration measures at appropriate scales to combat soil degradation processes, including desertification, or threats as defined in the EU Soil Thematic Strategy²⁴ (e.g. soil erosion, loss of organic matter, salinisation, compaction, sealing) under various climatic and environmental conditions around Europe. Through pilot projects or case studies including a demonstration phase and involving relevant stakeholders (including developers, industry and regulators), research will develop and validate measures to address these soil degradation processes or threats and to restore soil functions and ecosystem services. It should also assess the cost-effectiveness of these measures. It will also carry out an integrated impact assessment of the existing EU policies and strategies related to EU soil and land use to establish potential incoherence and contradictions.

Funding Scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 9 000 000.

One or more proposals can be selected.

Expected impact: Contribution to the achievement of the objectives of the EU Soil Thematic Strategy; underpinning of sustainable land use and management; support to the implementation of the EU Soil Sealing Guidelines; underpinning of the implementation of the EU Floods Directive²⁵; support to Member States in fulfilling relevant monitoring requirements under the UNCCD, particularly the mandatory impact indicators; support to the implementation of the European Landscape Convention²⁶; provision of relevant information for a variety of EU policies, including agriculture, energy, and regional development.

Specific feature: Projects selected under this topic will be linked through a coordination mechanism that will be defined during the negotiation stage. Costs of this coordination will be covered by project resources.

²⁴ http://ec.europa.eu/environment/soil/three_en.htm

²⁵ Directive 2007/60/EC of the European Parliament and Council of 23 October 2007 on the assessment and management of flood risks (Floods Directive), OJ L 288, 6.11.2007, p. 27.

²⁶ Florence, 20.10.2000, CETS No 176.

Additional eligibility criteria: Projects will only be selected for funding on the condition that the estimated EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

ENV.2013.6.2-5 Urban biodiversity and green infrastructure – FP7-ENV-2013-two-stage

Urban green infrastructure, such as green roof and walls, parks, urban forestry and tree plantations, urban farming areas, etc., can contribute to reverse the trend of biodiversity loss. It provides key environmental services in urban areas, improves the quality of life and health, strengthens diverse ecosystems and their services and links them with the ones in rural areas. It can help build resilience, for example in terms of adapting to climate change or coping with noise, and make important socio-cultural and economic contributions as part of a coherent ecosystem approach to governance.

The project should provide a sound evidence base for the development of green infrastructures and strategies for planning and design of green infrastructure in cities and urban areas, appropriately adapted to scales from the local to the city region level.

Research needs to assess the potential of sustainable use, as well as the status, trends, role and needs of urban biodiversity and ecosystem goods and services provided by urban green infrastructure in the face of urbanisation, climate change and challenges to health and well-being like noise. Of particular interest is the exploration of the innovation potential (including social innovation and health promotion) regarding the provision, valuation, protection and sustainable use of urban ecosystem services. Research will focus on linking environmental services with socio-cultural and economic services and engagement with local communities, as a contribution to a green economy.

Of particular interest is the study of planning and governance approaches that support the conservation and restoration of urban biodiversity and the building and maintaining of green infrastructure, taking into account conflicts of interest between various land uses and green infrastructures. Research will require an interdisciplinary approach.

Funding Scheme: Collaborative Project

The requested EU contribution shall not exceed EUR 6 000 000.

Up to one proposal can be selected.

Expected impact: Enhanced provision of ecosystem services by green infrastructure in correlation with environmental policy objectives. Link environmental services with socio-cultural and health aspects. Innovative contributions of ecosystem services to urban green economy. Tools/incentives for better implementation of environmental policies and improvement of environmental status, including the implementation of the Soil Sealing Guidelines. Enhanced collaboration between disciplines and stakeholders involved with urban green infrastructure, particularly at the local and the regional scale.

Additional eligibility criteria: Projects will only be selected for funding on the condition that the estimated EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

ENV.2013.6.2-6 Improved monitoring of the impact of cultivation on the environment using global Earth Observations – FP7-ENV-2013-two-stage

Views on cultivation practices have significantly shifted to encompass concerns about sustainability. In this context, the present topic aims at conducting the necessary research and innovation activities that can contribute to establishing a global observation system for the assessment of the impact of cropland areas and crop change (including agroforestry) on the environment.

Research under this topic should integrate coordinated satellite and in situ data into the GEOSS Data-CORE, enable the interoperability of this data and make it available to users in support of the development of a global system of systems for crop monitoring. It should also provide, in collaboration with SMEs, Earth Observation techniques, crop and agricultural land use monitoring methods, model development, and spatial and statistical analysis, with the purpose of better understanding land use changes, and their impacts, arising from shifts in cultivation practices. Finally it should contribute to the development of crop production projections through the use of global mapping strategies in order to assess the changes in the distribution of cropland areas and the associated cropping systems and evaluate the impacts of these changes on biodiversity, ecosystems and the broader environment.

The project should establish an international partnership, to enable the global agricultural and environmental monitoring community to compare results based on disparate sources of data over a variety of global cropping systems.

It should also ensure that a collaboration mechanism with GEO (Group on Earth Observation) is put in place to support the G20 Global Agricultural Geo-Monitoring Initiative (GEO-GLAM) to strengthen global agricultural monitoring by improving the use of Earth Observation for crop production projections.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 9 000 000.

Up to one proposal can be selected.

Expected impact: Significant European contribution to the G20 GEO-GLAM initiative, reinforcing the awareness of decision and policy makers about the impact of agriculture on the global environment; networking of agricultural and environmental monitoring and research organisations; capacity building directed at a sustainable agricultural environment and enabling the prediction of the impact of crop production on natural resources and ecosystems; improved transparency of agricultural crop production and international coordination for risk-management capacity; European leadership for an initial global agricultural land monitoring system based on both satellite and in situ observations.

Specific feature

This research should be conducted in collaboration with international partners from outside the EU. The participation and appropriateness of non-EU partners in the consortium will be carefully considered during the evaluation.

Additional eligibility criteria: Projects will only be selected for funding on the condition that the estimated EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

ENV.2013.6.2-7 Development of advanced technologies and tools for mapping, assessing, protecting and managing cultural landscapes in rural areas – FP7-ENV-2013-two-stage

Current environmental processes (e.g. climate change, water and soil pollution, erosion) and socio-economic pressure (e.g. urbanisation and industrialisation of rural areas, requirements for transport and energy supply etc.) are putting at risk Europe's cultural landscapes characterised by archaeological or historical remains. Improved knowledge of the impact of environmental and human factors, which have shaped landscapes over time, is essential to better understand the historical components of landscapes, help develop resilience to change and better define protection and risk mitigation strategies.

Research should be interdisciplinary and should target rural landscapes with significant archaeological or historical components deserving special protection at local or regional scale. It should aim to develop new technologies and methodologies for mapping, assessing, protecting and managing cultural landscapes. In particular, spatial analysis, remote sensing, modelling, sampling and characterisation of historic landscape structures, habitat and artefacts, protocols, planning, conservation and remediation actions, should underline and respect the main functions and values of cultural landscapes in rural areas, while also including the ecological and 'natural' dimension of the territories concerned. Outcomes should inform policies, strategies and governance by regulating/public authorities, landowners, planners and managers, taking into account the meanings of landscapes and changing perceptions. Selected case studies should clearly demonstrate how the technologies, methods and tools are effective in assessing various types and levels of degradation under different geographic and climatic conditions, and in validating strategies for landscape protection and restoration, while combining cultural and natural assets. The participation of public authorities, agencies or associations of citizens at an appropriate level within the consortium is strongly recommended.

Funding scheme: SME-targeted Collaborative Project

The requested EU contribution per project shall not exceed EUR 3 000 000.

Up to one proposal can be selected.

Expected impact: Contribution to innovative schemes and sustainable best practices for protection or remediation schemes applied to cultural landscapes of historic and archaeological value. Create a favourable economic impact on the rural areas and sectors of activities concerned, including the impact for tourism, by exploitation and transfer of research results at a regional, national, or European scale by eco-innovative services and SMEs. Protection of cultural landscapes and assessment of socio-economic impacts of their protection. Implementation of the European Landscape Convention²⁷.

Specific feature: This topic is targeted at SMEs, in appropriate partnership with research institutions and national/regional authorities and other stakeholders directly concerned.

Additional eligibility criterion: Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 20 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

²⁷ See footnote 266.

ENV.2013.6.2-8 Sustainable management of Europe's deep sea and sub-sea floor resources – FP7-ENV-2013-two-stage

Although the deep sea and sub-sea floors environments are still largely unknown, current research suggests that these environments modulate the global climate and contain immense mineral and biological resources. Because of the slow rates associated with deep sea processes, these systems are also particularly vulnerable to intervention and they will require careful management to preserve their function for future generations as human activities move into deeper waters. Research should therefore focus on the assessment of the environmental impacts of the exploitation of deep sea raw material resources and in particular rare earth minerals, hydrothermal mineral deposits, methane hydrates and similar seafloor and sub-seafloor resources that can be extracted using various techniques. It should also enhance the understanding of associated geological processes, e.g. the effect on the stability of methane hydrates and its repercussions for climate change or continental slope failures/tsunamis that endanger both ecosystems and society. Research should also assess the resilience of deep sea and sub-seafloor ecosystems and of biodiversity to resource extraction activities. It should determine recovery conditions, associated timescales and tipping points beyond which recovery is irreversible. Practices should be developed, including management practices, standards, legal instruments, covering national jurisdictions and international waters, concerning economically viable, environmentally sound and socially acceptable resource exploration and extraction. Finally it should assess and demonstrate new monitoring technologies and systems to fully determine the functioning of the deep sea and sub-seafloor ecosystems where the resources are found.

A pan-European, multi-disciplinary, cross-sectoral approach to ensure that knowledge and innovation are shared across Europe will be required.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 9 000 000.

Up to one proposal can be selected.

Expected impact: Enhanced knowledge base on issues related to the environmental impacts and processes linked to deep sea exploitation activities. Determination of the boundary conditions of environmentally sustainable exploitation activities. Improved governance of deep sea environments. Innovative technologies and systems, leading to increased European competitiveness in the marine technology sector. Substantial contribution to the implementation of relevant EU initiatives such as the Integrated Maritime Policy²⁸, 'A Resource-Efficient Europe' roadmap²⁹ and the Marine Strategy Framework Directive³⁰. Facilitate synergies with international initiatives like the Integrated Ocean Drilling Programme (IODP)³¹.

Specific feature: A significant involvement from the industrial sector will be required, ranging from large industrial companies (e.g. deep sea mining oil & gas, telecommunications) to SMEs. The assessment and demonstration of relevant technologies should be included as an activity within any proposal submitted to this topic. This topic complements actions to be

²⁸ Commission Communication 'An Integrated Maritime Policy for the European Union', COM(2007) 574 final of 10.10.2007.

²⁹ See footnote 3.

³⁰ Directive 2008/56/EC of the European Parliament and of the Council establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), OJ L 164, 25.6.2008, p. 19.

³¹ www.iodp.org

supported under the Theme 4 Nanosciences, Nanotechnologies, Materials and New Production Technologies.

Additional eligibility criteria: Projects will only be selected for funding on the condition that the estimated EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

CALL 'THE OCEAN OF TOMORROW – 2013': JOINING RESEARCH FORCES TO MEET CHALLENGES IN OCEAN MANAGEMENT

Fostering research and innovation on marine technologies

Topics implemented jointly with Food, Agriculture and Fisheries, and Biotechnology, NMP, Energy, Environment (including Climate Change) and Transport Themes.

Aims of the call

The EU Strategy for Marine and Maritime Research³² supports the EU integrated maritime policy's objective of a thriving and sustainable maritime economy. It is a key component in reconciling the growth of maritime activities with environmental sustainability and thus it contributes to the 'Europe 2020' goal of smart, inclusive and sustainable growth for Europe. In this context, "The Ocean of Tomorrow" calls for proposals aim to foster multidisciplinary approaches and cross-fertilisation between various scientific disciplines and economic sectors on key cross-cutting marine and maritime challenges.

"The Ocean of Tomorrow 2013" third cross-thematic call will focus on marine technologies. The development of competitive and innovative marine technologies is necessary to assess and monitor the good environmental status of the seas, monitor current and new activities and contribute to their sustainable operation. "The Ocean of Tomorrow 2013" call will therefore aim at pooling the efforts of stakeholders from various disciplines and sectors in order to develop innovative marine technologies for a wide range of applications.

Three key areas will be tackled: sensing technologies that are necessary to improve reliable measurements of key parameters in the sea, new materials that can avoid bio-fouling on mobile and stationary structures, and innovative transport and deployment systems for the offshore energy sector.

The call will be implemented jointly between Theme 2 "Food, Agriculture and Fisheries, and Biotechnology" (FAFB), Theme 4 "Nanosciences, Nanotechnologies, Materials and new Production Technologies" (NMP); Theme 5 "Energy", Theme 6 "Environment (including climate change)" and Theme 7 "Transport (including Aeronautics)".

"The Ocean of Tomorrow 2013" call fiche with all relevant information can be found in the Work programme of Theme 2 " Food, Agriculture, Fisheries and Biotechnology" (FAFB), as well as on the Participant Portal under the call page FP7-OCEAN-2013.

OCEAN 2013.1 – Biosensors for real time monitoring of biohazard and man-made chemical contaminants in the marine environment

Call: FP7-OCEAN-2013

Due to growing concerns about the health of the oceans and their capacity to continue to provide resources, goods and services as well as associated risks to the human health, there is an increasing demand for real-time monitoring of the environmental status of marine water quality and the provision of early warning systems. Real-time in situ monitoring of marine

³² COM (2008) 534 final of 3.9.2008 - Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: "A European Strategy for Marine and Maritime Research: A coherent European Research Area framework in support of a sustainable use of oceans and seas".

chemical contaminants (including emerging pollutants, biohazards e.g. algal toxins) is of utmost importance for the sustainable management and exploitation of the seas and their resources.

Technology wise, marine biosensors have the potential to offer unique features for highly specific and precise measurements, including under multi-stressor conditions, by combining technological elements (including nanotechnologies) and bio-receptors in a single measurement device. Thus they could open new avenues to respond to the growing need for accurate real time monitoring of the quality of sea water and marine ecosystems to support relevant EU legislations such as the Marine Strategy Framework Directive (MSFD)³³.

Based on most recent knowledge on genomics and physiology as well as on materials, nanotechnology, information technologies and relevant existing detection/monitoring technologies, the research under this topic should aim at developing innovative real-time, in situ biosensors, taking advantage of nanotechnology when applicable. These sensors should target the detection and monitoring of high impact and presently difficult to measure emerging pollutants and other substances, such as algal toxins and their producers, synthetic organics, herbicides/pesticides and persistent organic pollutants (POP), including polycyclic aromatic hydrocarbons (PAH) and should enable early diagnosis of deterioration of the environmental status of the marine waters in multi-stressor conditions.

The proposals should include a test phase to demonstrate the potential of these biosensor(s) for in situ environmental and/or aquaculture related applications. Measurement devices should show ability to compete with/complement non real time alternatives and provide faster, less expensive, and less time-consuming measurements than the currently available instrumental analytical methods. A proof of concept in terms of product and/or process should be delivered within the project demonstrating industrial manufacturability.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

Funding scheme: Collaborative project

Several projects may be funded within the total budget of the topic (EUR 15 000 000).

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 25% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected impact:

New biosensors in the field of marine environmental monitoring will:

³³ Directive 2008/56/EC of the European Parliament and of the Council establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), OJ L 164 of 25 June 2008.

- Enable early detection and more effective monitoring of the marine environment and its status and implementation of appropriate management actions in line with the Marine Strategy Framework Directive (MSFD);
- Improve sustainable management and exploitation of marine resources (such as fisheries and aquaculture) in particular the monitoring of quality of shellfish waters and minimise risks to human health;
- Provide competitive advantage and leadership to European industry, for example within the fields of biotechnology, sensor development, diagnostic technologies and nanotechnology.

OCEAN 2013.2 - Innovative multifunctional sensors for in-situ monitoring of marine environment and related maritime activities

Call: FP7-OCEAN-2013

There is an urgent need to improve the in-situ component of the ocean observing systems to achieve an appropriate and comprehensive understanding of the functioning of the marine environment at different geographic, temporal scales and the monitoring of marine and maritime activities to ensure their sustainable development. As commercially available sensors tend to be too large, expensive, and power-hungry for widespread use, reducing the cost for acquisition of data is a key priority in order to implement EU legislations such as the Marine Strategy Framework Directive (MSFD), the Common Fisheries Policy CFP), support international initiatives such as the Global Ocean Observing System (GOOS) and the Global Earth Observation System of System (GEOSS).

In this context the topic seeks to develop robust, easily usable across multiples platforms, cost effective multifunctional sensors and their packages that provide reliable in-situ measurements of key parameters. Research and demonstration activities under this topic shall address in a comprehensive manner all the following aspects:

1/ Developing cost-effective sensors suitable for large-scale production, taking advantage of "new generation" technologies such as within the fields of miniaturisation, communication, positioning systems, disposable technologies, and IT tools, software, energy storage and usage.

2/ Sensors should be compact, autonomous multifunctional integrated packages that could be deployed using free floating devices or, buoys, platforms, or ships of opportunities including fishing vessels. The sensors must be developed as precompetitive prototypes and field tested in close cooperation with stakeholders such as sensor designers, SME's, managers of monitoring/observing systems, marine industry e.g fishermen and end-users. An essential part of this topic will be to ensure technology transfer through an integrated approach, bridging between laboratory testing and commercially viable product.

3/ Addressing data flow issues, including data acquisition, access and retrieval, storage, transmission, standardisation, and pre-processing. The projects should take advantage of the latest web enablement technology for setting up sensors' networks suitable for open access and data sharing.

4/ Making the sensors fully interoperable with existing observing systems and compatible with standard requirement such as the EU Fisheries Data Collection Framework, the Marine

Strategy Framework Directive, the INSPIRE directive³⁴, the GMES and GOOS/GEOS initiatives.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

Funding scheme: Collaborative project

Several projects may be funded within the total budget of the topic (EUR 15 000 000).

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 30% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected impact:

The projects will:

- Provide a large increase in the temporal and geographic coverage from in-situ marine sensors to enhance the European contribution to Global Monitoring of the Oceans;
- Increase availability of standardised in-situ data that is suitable for integration within key marine observation, modelling and monitoring systems and reduce ocean modelling uncertainty;
- Reduce cost of data collection system in support of fisheries management;
- Advance competitiveness for European Industry's & particularly SME's within the Marine sensing sector;
- Enable better cooperation between key sectors (Manufacturing Industry, ICT, Maritime Industry, Marine Science, Fisheries etc.);
- Support implementation of European Maritime Policies (MSFD, CFP, IMP, etc.);
- Promote new discoveries leading to better understanding of the seas.

OCEAN 2013.3 Innovative antifouling materials for maritime applications

Call: FP7-OCEAN-2013

Biofouling is a major concern for mobile (e.g. ships) and stationary (e.g. aquaculture cages or offshore power generation systems) maritime structures, sensors and equipments. It negatively affects marine and maritime activities by creating a need for regular maintenance, which is costly, might disrupt operations and is potentially polluting. With the purpose of

³⁴ Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

avoiding toxic biocides and heavy metals used in antifouling coatings, novel alternative cost-efficient and environmentally friendly approaches are needed.

The proposals under this topic should focus on developing new, well beyond the state of the art, antifouling materials and should address in an integrative way mobile and stationary maritime applications.

On the basis of a thorough analysis of the state of the art, research could draw on the whole range of antifouling materials e.g. foul release approach, biomimetics, marine biotechnology based coatings, polymers etc. The proposals should include benchmarking of existing materials, technologies and on-going research. In this sense environmental and economic factors, as well as performance, must be duly considered.

Improvement in the understanding of marine biofouling processes, including their relation with biocorrosion, with respect of the developed materials should be an integral part of the proposals. For the resolution of the technological bottlenecks impeding the achievement of well performing final materials and products, applicants are welcome to investigate and exploit the potential offered by converging technologies such as e.g. materials science and engineering, maritime technology, nanotechnology and biotechnology.

The proposals should include relevant field testing for all the selected applications. Development, improvement and/or standardisation of relevant protocols should be included. Proof of concept in terms of product and/or process should be delivered within the project, excluding commercially usable prototypes (in compliance with European Commission Communication 2006/C323/01), but convincingly proving scalability towards industrial needs.

In the case of marine biotechnology based approaches the issues of supply and the need for the biobased active antifouling compounds to be produced in bulk, as required for final commercial production should be given due consideration.

The proposals should follow a life cycle approach for the new materials and their selected applications also taking into account issues of cost efficiency, effective life span, production, handling, maintenance, environmental impact, ecotoxicological profile and end of life. The proposals should include assessment of the environmental, health and toxicological effects according to REACH³⁵, OECD Guidelines for the Testing of Chemicals and/or relevant international standards.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

Funding scheme: Collaborative project

Several projects may be funded within the total budget of the topic (EUR 15 000 000).

³⁵ Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 8 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 25% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected impacts:

The projects will:

- Increase efficiency and competitiveness of maritime activities based on mobile and/or stationary maritime structures (transport, aquaculture, fisheries, marine energy) by reducing operation and life-cycle-costs, negative impacts on the marine environment and, in particular for the transport sector, CO2 emissions;
- Enhance competitiveness and sustainability of the European biotechnology, and/or materials related industry;
- Better understanding/assessment the scope of existing antifouling materials and technologies;
- Contribute to the implementation of EU policies, Environment policy (e.g. the Marine Strategy Framework Directive, REACH), Transport policy (Roadmap to a Single European transport Area – Towards a competitive and resource efficient transport system) as well as industrial and innovation policy, such as the EU Strategy for Key Enabling Technologies and the Lead Market Initiative on Bio-based products.

OCEAN 2013.4 Innovative transport and deployment systems for the offshore wind energy sector

Call: FP7-OCEAN-2013

In its Communication "Offshore Wind Energy: Action needed to deliver on the Energy Policy Objectives for 2020 and beyond", the Commission underlines that the exploitable potential of offshore wind by 2020 is likely to be 30-40 GW, and in the 2030 time horizon it could be up to 150 GW.

In 2007, the Energy Wind Association assessed that achieving 40 GW by 2020 will mean that 7,800 turbines of 5 MW need to be built over the next 13 years. Those turbines have to be assembled, transported and installed on sites.

The Strategic Energy Technology Plan (SET-Plan) European Wind Initiative identifies transport and logistic issues as key elements for the deployment and maintenance of offshore wind farms. The TP Wind Strategic Research Agenda also points to research needs both in relation to the cost-effective installation, maintenance, operation and decommissioning of large offshore wind farms as well as to transport, logistics and equipment needs.

In its Communication on Strategic goals and recommendations for the EU's maritime transport policy until 2018, the Commission stresses that maritime transport is an important instrument of the European energy policy. Amongst others offshore servicing vessels are considered as increasingly important aspect for ensuring the well functioning of the energy market.

Research activities under this topic shall address the following aspects:

- Development of innovative and cost-effective deployment strategies for large-scale turbines, including building and testing onshore;
- Elaboration of optimal logistical processes and on-land transport links for large offshore structures;
- Design of novel vessel types and equipment for installation, maintenance and decommissioning and validation at reduced scale;
- Development of safety procedures for installation, operation and maintenance activities, regarding both offshore wind structures and the vessels;
- Improved operations and maintenance including the enhanced role of remote condition monitoring and systems with reduced human intervention;
- Development of new business models at European level for large offshore systems based on integrated life-cycle approaches;
- Development of methods and tools to assess the field performance of offshore wind farms servicing vessels and for optimised service activities in terms of lead time and energy usage.

Proposals are expected to include validation activities at reduced but industrially relevant scale using testing models and where possible tests at real scale using existing infrastructure and equipment, adapting those to validate models and management tools. Tests should also address extreme conditions. The proposal should cover both ground based and floating wind parks.

The multi-disciplinary approach of the research undertaken is essential to address the topic. Knowledge exchange with oil/gas and maritime sectors is expected. These aspects will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion related to *Implementation*.

In the framework of the SET-Plan European Industrial Initiatives, a specific monitoring and knowledge sharing mechanism will be established under the auspices of the Commission and the selected project will be expected to participate.

Funding Scheme: Collaborative Project

Up to one project may be funded.

Additional eligibility criteria:

The requested European Union contribution shall not exceed EUR 10 000 000 per proposal.

Expected impact:

The project will:

- Contribute to the implementation of the roadmap activity of the European Wind Initiative aiming at supporting offshore take-off in the medium-term;
- Contribute to the development of new niche markets for the European shipbuilding and shipping industries thereby contributing to competitiveness of the sector and to the creation of new jobs.

Challenge 6.3 Improving resource efficiency

Indicative budget: EUR 95 million (*of which EUR 40 million for the call ENV.2013.WATER INNO&DEMO and EUR 6 million for the Public Private Partnership 'Energy Efficient Buildings Initiative'*)

Improving resource efficiency will help Europe to stimulate its economy and face the challenge of sustainable growth at a time of increasing energy prices, carbon constraints and greater competition for limited resources and markets. Research and innovation activities will aim to address the challenge of transitioning to a green economy while supporting important EU policy commitments included in the Roadmap on a Resource-Efficient Europe³⁶ and the Eco-Innovation Action Plan³⁷ and contributing to measuring progress towards the green economy. Research will also contribute to the aims of the proposed European Innovation Partnerships on 'Water'³⁸ and 'Raw Materials'³⁹. Research and innovation will promote the development and testing of highly eco-innovative technologies, processes and services to valorise urban wastes and recover raw materials from industrial wastes, favouring a bottom-up approach, while also considering macro-level impacts, including rebound effects. Eco-innovation demonstration projects in selected areas will aim to improve the viability of cutting-edge technologies and foster the exploitation and up-take of new solutions, management and business models enhancing the efficiency and sustainability of resource use. The latter will increase the chances of market penetration and contribute to the implementation of current environmental standards. In the area of raw materials activities will be undertaken in cooperation with other Themes, e.g. cutting-edge technologies, processes and services for the optimum use of raw materials. Global assessment of water resources will be also performed based on the integration of in situ and space observation data.

ENV.2013.6.3-1 Turning waste into a resource through innovative technologies, processes and services – FP7-ENV-2013-two-stage

The overall objective of this topic is to reduce environmental impacts through innovative, breakthrough solutions that lead to a reduced demand for raw materials and contribute to more efficient use of materials generally, thus supporting important EU policy commitments reflected in the Roadmap to a Resource-Efficient Europe and helping to create a bridge with future Horizon 2020 activities on 'Climate action, resource efficiency and raw materials'. Proposals must focus on solid waste management (including existing industrial and urban waste dumps) and address one of the following two sub-topics:

a) Valorisation of urban solid waste. Research should focus on the development of innovative solutions which aim for a radical change in the way of collecting, handling, separating, processing, upcycling or transforming urban solid wastes and/or the development of new added-value products and services with good market potential based on recycled urban waste. This activity should contribute to more efficient and cost-effective urban mining and to a more circular economy.

³⁶ See footnote 3.

³⁷ http://ec.europa.eu/environment/etap/index_en.html

³⁸ <http://ec.europa.eu/environment/water/innovationpartnership/>

³⁹ http://ec.europa.eu/enterprise/policies/raw-materials/innovation-partnership/index_en.htm

b) Recovery of valuable raw materials from industrial waste. Research should address new, radical, different and sustainable solutions for the collection, recovery and preparation for reuse of raw materials (like e.g. critical metals and minerals as defined in the context of the Raw Materials initiative⁴⁰) from waste from key industrial sectors such as construction, chemicals, aerospace, machinery and equipment, automotive or ICT. New business models and reuse-oriented services to enable an efficient management of raw materials should be also considered. This topic complements related activities to be supported under Theme 4 Nanosciences, Nanotechnologies, Materials and New Production Technologies.

In both cases, proposals should demonstrate how the research foreseen will contribute to improving the environment, including how it will promote the development of new economic opportunities, improve resource efficiency and boost competitiveness. Proposals should also demonstrate that the proposed solutions have the potential to be substantially more sustainable, from a life cycle perspective, than current practice, should consider both direct and indirect, both positive and adverse impacts and, where appropriate, contribute to the standardisation process⁴¹. Pilot trials at an appropriate scale should be envisaged to facilitate future market uptake.

Funding scheme: SME-targeted Collaborative Project

The requested EU contribution per project: (as appropriate, wide range expected from such a bottom up call)

One or more proposals can be selected.

Expected impact: Breakthrough innovation in novel technologies, products or services with high potential to achieve a more green economy. More sustainable consumption and production patterns. Improved resource efficiency and reduced environmental impacts. Reduced waste production and pressure on raw materials. New business models, industrial symbiosis, and cradle-to-cradle approaches. Substantial contribution towards the sustainable supply of raw materials of economic importance in Europe. Improved communication and transfer of knowledge to policy making, business and to the general public.

Specific feature: This topic is mainly addressed to SMEs and industries, in appropriate partnership with research institutions and other stakeholders. Involvement of R&D performing SMEs is encouraged to ensure maximum impact. This topic contributes to the aims of the proposed European Innovation Partnership on 'Raw Materials'.

Additional eligibility criterion: Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 30 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

ENV.2013.6.3-2 Eco-innovative demonstration projects – FP7-ENV-2013-two-stage

A significant gap still exists between the availability of new eco-innovative technologies, processes and services and their successful commercialisation into marketable products or services. The aim of this topic is to support the effective demonstration of existing cutting edge eco-innovative technologies⁴², processes and services, which in spite of their high environmental and market potential have not succeeded in reaching the market. This topic

⁴⁰ http://ec.europa.eu/enterprise/policies/raw-materials/critical/index_en.htm

⁴¹ Where appropriate, the use of the EU pilot programme on Environmental Technology Verification (ETV) is encouraged (<http://ec.europa.eu/environment/etv/index.htm>)

⁴² See footnote 41

targets only technologies, processes and services that can demonstrably enable radically stricter, smarter and more ambitious environmental standards (considering the integral footprint, including emissions, efficiency in use of resources, or other pressures on the environment) to be reached than those currently in place. In addition, the long-term sustainability of these eco-innovative technologies, processes and services should be considered. Research should focus on demonstration activities, prior to commercialisation, such as the testing of the technological performance and economic viability of prototypes, tools, and/or management systems, benchmarking and validation activities, up-scaling from laboratory/pilot scales to large urban/rural scales, etc. Technology transfer, training activities and standardisation activities in cooperation with appropriate European standardisation bodies should be also included. Market replication⁴³ and market demonstration activities, product development and commercial development activities are excluded from this topic. Participation is open to all industrial sectors. Eco-innovative fields of application of the projects might include: construction and demolition waste; remediation of contaminated sites; pesticides and fertilisers in agriculture; urban mining; waste from electric and electronic equipment; climate change adaptation. Demonstration proposals related to water applications must be addressed under topic ENV.2013.WATER INNO&DEMO-1.

Funding Scheme: SME-targeted Collaborative Project

The requested EU contribution per project: (as appropriate, wide range expected from such a bottom up call)

One or more proposals can be selected.

Expected impact: More rapid market uptake of already developed eco-innovative technologies with high potential to preserve the environment. Opportunities for new start-ups and markets in the short and medium term. Implementation of the Eco-innovation Action Plan⁴⁴ and the Roadmap to a Resource-Efficient Europe⁴⁵. Improved communication and transfer of knowledge to policy making, business and to the general public. Building up European citizens' awareness of eco-innovation opportunities and raising social acceptance of eco-innovative technologies and production patterns.

Specific feature: This topic is mainly addressed to SMEs and industries, in appropriate partnership with research institutions and other stakeholders. Involvement of R&D performing SMEs is encouraged to ensure maximum impact.

Additional eligibility criterion: Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 30 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

⁴³ <http://ec.europa.eu/ecoinnovation>

⁴⁴ See footnote 37.

⁴⁵ See footnote 3.

ENV.2013.6.3-3 Contribution to the assessment of global water resources through the use of new Earth Observation datasets and techniques – FP7-ENV-2013-two-stage

Environmental change and human activities are exerting increasing pressure on water resources in many regions of the world. The full extent of available water is, however, difficult to estimate, even in data-rich watersheds. This requires comprehensive datasets and information products supporting efficient management and decision-making, achieved through the use of co-ordinated and sustained observations of the water cycle at multiple scales, including globally. Research under this topic should therefore test new parameters and data sources for the monitoring of global water resources, including those provided by European remote sensing missions (for example GOCE, Cryosat-2, SMOS and the EUMETSAT Polar System), seeking to improve current monitoring capabilities in terms of resolution and reliability. It should also address the quantification, quality and availability of global surface and groundwater resources, and the modelling of their evolution over time. Finally, it should integrate the required in situ and remote-sensing data into the GEOSS Data-CORE, enable the interoperability of these data and then use them to make global datasets available to users in support of the development of a global system of systems for assessing global water resources, water scarcity and drought.

Funding Scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 9 000 000.

Up to one proposal can be selected.

Expected impact: Increased availability of information products and services for monitoring regional and global water resources. Significant contribution to a GEOSS Water Cycle Integrator (WCI) to provide holistic views of water cycle information, through integration of observations, research, modelling and analysis. Advanced Earth Observation system for the support of international agreements on water management and European water policies. More efficient distribution of water at regional level, in particular in developing countries by building the required knowledge base and providing information on ground water, coastal zones, floods and droughts to public authorities, decision makers and citizens.

Specific feature: This research should be conducted within an international framework including non-EU partners.

Additional eligibility criteria: Projects will only be selected for funding on the condition that the estimated EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

ENV.2013.WATER INNO&DEMO-1 Water innovation demonstration projects – FP7-ENV-2013-WATER-INNO-DEMO

The objective of this topic is to mobilise industry, Member States and stakeholders into promoting innovative solutions for water-related challenges, leading to the effective implementation of European directives and policies while creating market opportunities for European industry and SMEs. This will be achieved through the launch of demonstration projects in areas of urban water management (for example the reduction of water consumption, improved efficiency of distribution systems and waste water treatment processes), rural water management (for example promotion of re-use of water, agricultural and natural ecosystem water use, reduction of flood risks, enhancement of the quality of water

services), and industrial water management (for example the minimisation of energy and water use, closed water cycles, reduction of environmental impact of effluents, recovery of raw material from waste water). The projects will develop, test and disseminate innovative solutions, based on the integration of technological, organisational, financial, ICT and management approaches and strengthen standardisation in the water sector⁴⁶. Demonstration projects should preferably be of an appropriate scale to enable the bringing together of various sites across Europe, facing similar water challenges, in an integrated and coordinated way. Nevertheless, if justified in terms of scope and ambition, small scale projects could be also submitted and could be clustered later. Proposals should also demonstrate links and synergies with related major water investment/implementation projects at local, regional or national level to help leverage the demand side across the whole value chain from research to markets and strengthen complementarity with various EU funding mechanisms. Dissemination and exploitation activities, improve communication and transfer of knowledge both to policy making, business and to the general public, as well as activities aiming to increase the likelihood of market uptake of the project results should be also part of the demonstration projects.

Funding scheme: SME-targeted Collaborative Project

The requested EU contribution per project shall not exceed EUR 6 000 000

One or more proposals can be selected.

Expected impact: Implementation of the Europe 2020 Flagship Initiative on Innovation Union⁴⁷, contribution to the Commission's initiative on 'Smart Cities and Communities'⁴⁸, and especially contribution to the aims of the proposed European Innovation Partnership on 'Water'⁴⁹, to promote growth and job creation in Europe. Strong partnership between public authorities, regulators, water utilities and companies, the research community and the public, to make best use of existing instruments, and to align and pool resources in order to adopt innovative water solutions more rapidly. Achieving the objectives of water-related policy. Creation of market opportunities and increased demand for innovation leading to global leadership for the European water technology and services sectors. Projects should clearly demonstrate their capability to facilitate market uptake and their potential to stimulate demand side measures for innovation.

Specific feature: This topic is mainly addressed to SMEs and industries, in appropriate partnership with research institutions and other stakeholders. Involvement of R&D performing SMEs is encouraged to ensure maximum impact. This topic contributes to the aims of the proposed European Innovation Partnership on 'Water'.

Additional eligibility criterion: Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 30 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

⁴⁶ See footnote 41.

⁴⁷ See footnote 2.

⁴⁸ http://ec.europa.eu/energy/technology/initiatives/smart_cities_en.htm

⁴⁹ See footnote 38.

ENV.2013.WATER INNO&DEMO-2 Ensuring the integration of water and innovation demonstration projects and support to trans-national networks of procurers – FP7-ENV-2013-WATER-INNO-DEMO

Proposals must address one of the following two sub-topics:

a) Creation of a network to ensure an optimal coordination between the various sites of the demonstration projects selected in topic ENV.2013.WATER INNO&DEMO-1 and future Innovation Sites listed as indicative priority areas in the proposed European Innovation Partnership on 'Water', to promote a continuous dialogue and exchange of good practices between all actors involved, improve communication and transfer of knowledge, and, finally, to identify gaps in matching demand and supply innovation measures. This network should be built on existing successful technology platforms and partnerships, bring together both the public and private water sectors, and should liaise with the secretariat of the proposed European Innovation Partnership on 'Water';

b) Promotion and development of innovation-oriented public procurements in the domain covered by the proposed European Innovation Partnership on 'Water', with a view to enhancing the strategic use of public procurement at regional and/or local level in order to stimulate creative responses from the market, uptake of R&I results and to develop innovative public services. Public authorities (e.g. public purchasers such as national/regional/local governments and/or their agencies, public authorities responsible for R&I programmes such as research councils, R&I funding agencies) wishing to work together in developing innovative procurements (including pre-commercial) are encouraged to test innovative procurement policies.

Funding scheme: Coordination and support action (coordinating action)

The requested European contribution per project shall not exceed EUR 1 000 000.

Up to one proposal can be selected for each sub-topic.

Expected impact: Implementation of the Europe 2020 Flagship Initiative on Innovation Union⁵⁰, and especially contribution to the aims of the proposed European Innovation Partnership on 'Water'⁵¹, to promote growth and job creation in Europe. Strong partnership between public authorities, regulators, water utilities and companies, the research community and the public, to make best use of existing instruments, and to align and pool resources in order to adopt innovative water solutions more rapidly. Reduce fragmentation of public sector demand by enabling public bodies to collectively implement procurements strategies (including Pre-Commercial Procurement (PCP)) and joint actions so as to tackle problems in a more efficient way. Share risks and benefits of designing, prototyping and testing⁵² a limited number of new products and services with suppliers. Increased opportunities for wide commercialisation and uptake of R&I results.

Specific feature: This topic contributes to the aims of the proposed European Innovation Partnership on 'Water'.

⁵⁰ See footnote 2.

⁵¹ See footnote 38.

⁵² See footnote 41.

Public-Private Partnership 'Energy Efficient Buildings Initiative'

Topic implemented in cooperation with NMP and Environment (including Climate Change) Themes.

The indicative budget of the '*Energy Efficient Buildings Initiative*' is EUR 116 million in 2013, of which EUR 110 million is from the NMP Theme and EUR 6 million from the Environment Theme. For further details of the implementation of the call please see the Annex 5 of the Cooperation work programme.

EeB.ENV.2013.6.3-4 Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts – FP7-2013-NMP-ENV-EeB

This topic is a contribution to the 'Energy efficient Buildings' (EeB) Public Private Partnership. The objective is to develop improved, easy to use tools that support cost-effective decision making through design, planning and implementation of renewal/retrofitting projects (including decisions such as demolishing vs retrofitting). These tools should particularly focus on the energy performance of buildings, the impact of district space planning and connections with networks and related installations (transport, energy, water, waste). The tools should also ensure the adoption of the most cost-optimal and affordable solutions for adapting, renewing and retrofitting groups of existing buildings that may include historic structures, fully incorporating the latest innovations and best available technologies that deliver significant energy efficiency improvements while addressing multiple resource challenges and ecosystem-based approaches, such as, for example, green roofs and walls. These solutions may cover indoor and outdoor issues, as well as social and economic concerns. Sufficient emphasis should be given to the demonstration and verification of the tools to be developed and their ability to evaluate in detail the impact potential of the solutions considered along the entire life cycle from design to decommissioning and recycling. Quantification of improvements in resource efficiency, improved health and comfort and lower greenhouse gas emissions is expected, both at the micro (projects) and macro (economy) scale, taking into account the rebound effect. Economic impacts including cost-benefit analysis and investment amortisation should also be considered, using renovation projects as case studies. Projects should specifically involve developers and public authorities whilst fostering the integration of the overall value chain involving architects, constructors, operators, financing entities, users, etc. SMEs should also be actively involved. The tools to be developed should take advantage of the use of standardised or pre-standardised metrics for sustainable buildings, including those being developed in on-going EU funded projects such as 'OpenHouse' and 'Superbuildings'.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 3 000 000.

One or more proposals can be selected.

Expected impact: Demonstrably improved resource efficiency of existing buildings and clear reduction in energy use, in particular, together with associated CO₂ emissions. Benefits to stakeholders across the entire value chain including SMEs, leveraging the latest innovations that incorporate technologies from a wide variety of disciplines (e.g. architecture, civil and environmental engineering, energy technologies, restoration and conservation technologies, computer science, social sciences, to name just a few). Guidance to local community development agencies, developers, SMEs as suppliers and users of technologies, etc. Civil society organisations are welcome when appropriate. Support for the implementation of the

Directive on the Energy performance of buildings⁵³ and the Roadmap to a Resource-Efficient Europe⁵⁴. Contribution to the aims of the Commission's initiative on 'Smart Cities and Communities'⁵⁵.

Additional eligibility criteria: Projects will only be selected for funding on the condition that the estimated EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

⁵³ Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings, OJ L 153, 18.6.2010, p. 13.

⁵⁴ See footnote 3.

⁵⁵ http://ec.europa.eu/energy/technology/initiatives/smart_cities_en.htm; see FP7-SMARTCITIES-2013 and also topics FP7.ENERGY.2013.8.8.1 and FP7-ICT-2013.6.4 under the coordinated call on Smart Cities and Communities between Themes 3 (ICT) and 5 (Energy).

Challenge 6.4 Protecting citizens from environmental hazards

Indicative budget: EUR 36 million

Novel global approaches to protect citizens' health from emerging environmental risks will be explored. In particular research will enhance a comprehensive understanding of — and comparable data on — population exposures in Europe, by combining large-scale exposure data with population health data from a pilot European Exposure and Health Examination Survey⁵⁶. In the field of electromagnetic frequencies, independent and more robust exposure assessment and health impact studies have to be deployed in order to respond to the rapid growth of new information and communication technologies. In the field of natural hazards, recent disasters in Japan, Asia and Europe require from research and innovation to explore more thoroughly ways and means to better learn how to prepare, prevent, monitor, forecast, warn, defend and react in view of similar events. This will contribute to more reliable and precise tsunami early warning systems, to sound methodologies for implementing stress tests for main infrastructures and to new means for defending coastal areas and populations from multiple hazards (including coastal and flash floods).

ENV.2013.6.4-1 Assessing individual exposure to environmental stressors and predicting health outcomes: paving the way for an EU-wide assessment – FP7-ENV-2013-two-stage

The majority of major chronic human diseases are likely to result from the combination of environmental exposures to chemical and physical stressors and human genetics; however, the environmental determinants are poorly understood in comparison to the genetic factors. Thus, new approaches relying on the concept of the individual exposome, representing all environmental contributors to disease received by an individual during a lifetime, are needed to better understand the underlying mechanisms of environment-health/disease associations. The aim of the research is to collect new harmonised and standardised large-scale exposure data from European populations to improve the quality and comparability of the input data across countries, with attempts to link individual and population-based exposure data to health data. The latter could consist of data available in health registries or new data that could be collected together with exposure data, e.g. through a pilot European Exposure and Health Examination Survey. Individual exposomes should be characterised by utilising existing biomarkers, and by developing biomarkers of exposure and effect based on epigenetics or other approaches. Strategies to improve the bioinformatics tools to handle the large amounts of data generated should also be considered.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 12 000 000.

Up to one proposal can be selected.

Expected impact: Better and innovative European preventive strategies by improving assessment of individual exposures. Reduction of fragmentation of exposure data across the EU and contribution to harmonisation and comparability of data. Improved EU risk

⁵⁶ http://ec.europa.eu/health/data_collection/tools/mechanisms/index_en.htm#fragment1

assessment and management activities in the area of Environment and Health. Combining exposure and health assessment in an EU-wide study. Integration of the research and innovation dimension by development of innovative approaches to assess exposure-health relationships in an integrated manner. Development of the European Research Area.

ENV.2013.6.4-2 Closing gaps of knowledge and reducing exposure to electromagnetic fields (EMF) – FP7-ENV-2013-two-stage

As previous studies have been inconclusive as regards possible health effects of exposure to EMFs, further research should be carried out to better understand the possible mechanisms generating biological effects through the use of novel approaches, as well as to collect and improve exposure and health risk assessment of EMFs, and also to underpin policy development. A large-scale prospective population study – that could reach beyond the EU – could be envisaged to investigate, *inter alia*, the role of radiofrequency (RF) exposures in cancer risk, neurodegenerative diseases, reproductive problems, behaviour and ageing, and exposure and health effects from intermediate frequency (IF) fields. More data on cumulative personal exposures from various sources should be collected. The research should also propose non technological means to reduce exposure.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 6 000 000.

Up to one proposal can be selected.

Expected impact: Support to EU and national regulatory bodies and policies by improving reliability of research data on potential effects of EMF exposures. Contribution to EU risk assessment and management activities through an improved evaluation of cumulative and integrated personal exposure. Application of novel approaches (e.g. systems biology) to EMF health research. Underpinning of non-technological means to reduce exposures.

ENV.2013.6.4-3 Coasts at threat in Europe: tsunamis and climate-related risks – FP7-ENV-2013-two-stage

Recent climate-related and tsunami catastrophic events have highlighted the increased exposure and vulnerability of societies in coastal areas. Research should strongly enhance today's forecasting, prediction and early warning capabilities in order to improve the assessment of coastal vulnerability and risks and develop adequate prevention, mitigation and preparedness measures. The knowledge gathered and lessons learned from recent dramatic events (e.g. Great East Japan Tsunami, Xynthia storm in France, Liguria flash floods), as well as from past and on-going EU research, should be used in order to design and develop management approaches to minimise social and economic losses and environmental impacts and increase resilience to such events.

Proposals should either address tsunamis or extreme hydro-meteorological events (e.g. extreme winds, storm surges, coastal and estuarine floods — taking in consideration the effects of climate change) and should focus on the respective key research challenges. Research should focus on Europe, but international cooperation with any third countries experiencing the same type of threats and willing to share know-how is encouraged. Innovative, cost-effective, technological or non-technological solutions as well as ecosystem-based approaches should be explored. Organisational and institutional/governance aspects have to be considered as well.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 6 000 000.

One or more proposals can be selected.

Expected impact: Faster attainment of the disaster risk reduction goals of UNISDR (United Nations International Strategy for Disaster Reduction). Design of cost-effective risk-reduction plans, based on the proposed tools and solutions. Improved risk governance and preparedness through the provision of timely information and warnings to decision-makers.

Specific feature: Projects should consider attributing a specific budget to clustering activities with projects on related issues selected in this call and, where relevant, with those projects resulting from the collaborative research action on 'coastal vulnerability' announced in the first call of the International Opportunities Fund by the Belmont Forum⁵⁷.

ENV.2013.6.4-4 Towards stress tests for critical infrastructures against natural hazards – FP7-ENV-2013-two-stage

Rare low frequency high consequence natural hazards events can have catastrophic impacts on critical infrastructures and trigger cascading effects. Climate change, population dynamics, urbanisation and other global change factors affect the damage potential. Research should capitalise on knowledge acquired so far in various sectors having already developed stress test methodologies and from the lessons learned after Fukushima and adapt it for critical (non nuclear) infrastructure types that may be threatened by key natural hazards in Europe.

Investigations therefore need to address the definition, harmonisation and development of standards, critical parameters and methodologies for hazard and risk assessment for low-probability, high consequence events in Europe that could be applied in future stress tests. Issues like full exploration of uncertainties, expert judgement, site-specific versus regional assessment of hazards, multiple risks, time-dependent vulnerability, possible degradation, cascade effects and the interactive environmental and societal changes have to be considered as well. Test applications should illustrate the benefits of improved hazard and risk assessment for key critical sites in Europe.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 3 000 000.

One or more proposals can be selected.

Expected impact: Reinforced European safety assessment capacity. Improved and more reliable stress tests of critical infrastructures. Support for decision making and prioritisation in the field of mitigation options and support to preparedness. Better surveillance capacity.

Specific feature: Projects selected under this topic will be linked through a coordination mechanism that will be defined during the negotiation stage. Coordination with related actions under the EURATOM programme⁵⁸ and the Security Theme⁵⁹ will also be established. Costs of this coordination will be covered by project resources.

⁵⁷ www.belmontforum.org/iof

⁵⁸ See EURATOM topic Fission-2012-2.1.3: Consequences of combination of extreme external events on the safety of Nuclear Power Plants (NPPs)

⁵⁹ See work programme Security- topic SEC-2013.2.1-2 Impact of extreme weather on critical infrastructure-capability project.

Challenge 6.5 Mobilising environmental knowledge for policy, industry and society

Indicative budget: EUR 31 million (*of which EUR 4 million for the FP7-ERANET-2013 call*)

Activities within this challenge aim to stimulate innovative approaches and tools to facilitate knowledge transfer, and uptake and exploitation of research data and results by policy makers, enterprises and society at large. In the post Rio+20 context, activities will focus on analysing the policy and socio-economic implications of climate agreements, taking stock of sustainable development indicators and support tools, identifying pragmatic solutions and best practices for policy makers in the EU and beyond, while also enabling the development of sustainable solutions and models for businesses. Networking and clustering of projects and research players will further the uptake of research results and promote sustainable R&I co-operation with Latin America, ASEAN and the Neighbourhood Policy countries. Furthermore, environmental knowledge will be harnessed to support EU policies in areas of societal interest such as disaster risk reduction, raw materials, resource efficiency and air quality, as well as in the Danube region. Foresight will aim to provide insight into the medium and long term trends and prospects of research and innovation, policy developments and market potential of new technologies in the areas of climate, resource efficiency and raw materials under Horizon 2020. In order to promote sustainable economic development both in the EU and in third countries, attention will be paid to sharing and exploiting knowledge from many varied sources, in particular the EU programme on Global Monitoring for Environment and Security (GMES), the Global Earth Observation System of Systems (GEOSS) and the GEOSS DataCore. To support the European Research Area in this field, an ERA-NET Plus will be launched on cultural heritage.

ENV.2013.6.5-1 Accelerating progress towards the Green Economy – FP7-ENV-2013-one-stage

The Green Economy is a vehicle to deliver sustainable development. It offers win-win opportunities to all countries regardless of the structure of their economy or their level of development. It builds on resource efficiency and its progress needs to be monitored. The exchange of best practice between all stakeholders needs to be encouraged at global level. Proposals should address one of the following three sub-topics to facilitate the acceleration towards a Green Economy in a global context:

a) Measuring progress: stocktaking

Many initiatives were launched to create indicators and various support tools aimed at quantifying the environmental and the economic impacts of human activities. Research should take stock of the work carried out globally in the field of sustainable development indicators, including those that can complement or replace GDP, and in the field of support tools such as those focusing on physical aspects, like energy throughput, life cycle and ecosystem assessments, and those integrating the economic dimension, like input-output databases. An assessment of on-going activities in this field and their outcomes should be carried out including identifying pragmatic solutions for Europe, and providing readily usable tools for policy makers. Potential research gaps should be identified and suggestions offered on how to overcome them.

b) Best practices and lessons learnt in the field of eco-innovation

The objective of this action is to develop a suitable structure and web-environment tool for the exchange of relevant experiences, developments, best practices and research outputs from programmes and projects in support or leading to eco-innovation. The tool should address both technological and non-technological innovation, built around relevant cases of successful and unsuccessful eco-innovation obtained from a variety of societal parties and actors, and provide a basis for further analysis and assessment of processes resulting in incremental or disruptive innovation for sustainability, success factors and remaining barriers. Participation of policy makers and SMEs is strongly encouraged, with the aim of acquiring a one-system approach which caters for various target groups, thereby encouraging cross-sectoral information exchange and information spill-overs. For maximum benefit, impact, and efficiency, substantive linkages and cooperation should be sought with relevant European networks including Eco-Innova and EcoPol, as well as with the Eco-Innovation Observatory.

c) Business practices for promoting 'Green Economy' and sustainable production and consumption post Rio+20

There is a need to stimulate the post RIO+20 dialogues between the private sector and the research community on issues related to 'Green Economy'. The objective is to create a thematic knowledge base that would feed the discussion on sustainable consumption and production at international level as a contribution to the global green economy research agenda. Activities should focus on developing and supporting a network for global exchange of best practices between EU and non-EU actors involved in sustainable consumption and production. It should encourage cross-sectoral and multi-stakeholder research to develop sustainable business solutions and business models. Models, tools, instruments and practices identified will address the optimal mix of the following issues: resource management, job creation, social inclusion, governance and environmental footprints along the value chain and will look at their replicability and scaling up in different sectors and contexts, including beyond the EU borders.

Funding scheme: Coordination and Support Action (coordinating action)

The requested EU contribution per project shall not exceed EUR 1 000 000.

Up to one proposal can be selected per sub-topic.

Expected impact: Faster transition to a green European economy with positive impacts on the rest of the world. Tangible, enhanced and innovative implementation of the Flagship Initiatives on the Innovation Union⁶⁰, the EC Communication on a 'Roadmap to a Resource-Efficient Europe'⁶¹, the Eco-innovation Action Plan⁶² as well as the EU Strategy for Sustainable Development⁶³. Evidence based identification by policymakers of the most adequate indicators and support tools that can be directly and easily used. Reinforced dialogue at international level. Reinforced governance tool to speed up the transition towards more sustainable business options. Demonstrated contribution to job creation within a sustainable development context. Better dissemination of eco-innovation best practices and stronger policy guidance to support measures for eco-innovation uptake. Improved networking between policy makers, SMEs, eco-innovators and civil society organisations. Recognition of the benefits of eco-innovation by the business community. Improved communication and transfer of knowledge to policy making, business and to the general public.

⁶⁰ See footnote 2.

⁶¹ See footnote 3.

⁶² See footnote 37.

⁶³ See footnote 19.

ENV.2013.6.5-2 Mobilising environmental knowledge for policy and society – FP7-ENV-2013-one-stage

Innovative approaches and tools are needed for policy makers to facilitate the proper consideration and uptake of available scientific knowledge in key areas in policy making. Proposals should be innovative and address one of the following six key sub-topics to facilitate improved knowledge transfer and uptake, provide appropriate tools and models to manage information and data for policy makers both within Europe and globally, and raise awareness of natural resources, including raw materials:

a) Policy and economic implications of the post-2012 climate agreements

The action will contribute to a better understanding of the key policy and socio-economic implications of post-2012 climate agreements at the global level, as well as the specific benefits, costs and opportunities that this will entail for Europe. Key issues to be addressed may include: effectiveness of the new international regime in delivering the required mitigation objectives; projected socio-economic impacts; the role of low-carbon technology development and transfer; relationship between climate change and land-use trends; trends in energy prices. The analysis will also take into due consideration mitigation and adaptation requirements in both developing countries and emerging economies.

b) Improved science-based policy decision making in disaster risk reduction

Various barriers (e.g. legal/institutional, political, cultural, historical, socio-economic) hamper the proper consideration of available scientific knowledge in decision making related to disaster risk reduction. Moreover, this is framed in an evolving situation where climate-related extreme events are growing and are expected to grow more in the future (see IPCC SREX report). There is a need for a better understanding of how risk-based decision mechanisms work, how information/knowledge is used, who are the actors involved, how information flow gaps are manageable in various socio-economic conditions and hazard levels. The management of uncertainty (and of cascades of uncertain events), and its impact on decision-making, have to be developed. A collaborative dialogue among stakeholders, policy makers, practitioners and scientists from different disciplines should enable mapping of relevant processes, identifying barriers, and proposing corrective methodologies and good practices for communication and knowledge transfer at different levels. The project should aim to explore ways to strengthen linkages and communication between disaster risk reduction and climate change adaptation communities.

c) Empowering international economic development through the use of environmental Earth Observations

The action will explore opportunities for economic development, in particular in developing countries, empowered by integrating and exploiting economic development initiatives and environmental Earth Observations. Work should identify the key international economic development processes that require environmental information and identify mechanisms to develop them in a sustainable fashion. Capacity building within local communities and local authorities should be addressed, enabling them to collaborate with international development programmes, use environmental Earth Observation information and products, and engage resource providers such as donors and the financial sector. The action should also look to catalyse the marketing and exploitation of Earth Observation applications for the creation of new innovative products and support services.

d) Raising societal awareness and tackling skill shortages on raw materials

The objective of this action is to support activities in order to mobilise the participation of civil society and industry, including SMEs, in a dialogue on raw materials and resource efficiency; to launch public debate and raise awareness of the opportunities and strengths related to the efficient use of raw materials; to raise the societal acceptance of their

substitution, replacement and recycling; and to help universities and industries, as well as geological surveys, tackle the problem of skill shortages in the European mining sector and green technologies for raw materials processing.

e) Implications of socio-economic research on air pollution policy

The objective of this action is to analyse the socio-economic aspects associated to national, regional and EU wide air pollution policy and to explore ways to better integrate the socio-economic dimension in those policies, in particular with respect to preferences, behaviour and responses of individuals and stakeholder groups (including civil society). Factors influencing the uptake by citizens of individual-level measures to improve air quality should be considered. In the cases where noise is a problem associated to air pollution, it should be analysed consistently. This action will deliver regular specific reports in support to the ongoing revision of the EU Air policy and links should be established with the EU funded coordinated action in the field of 'Integrated assessment of Air Pollution'.

f) Designing environmental research and innovation for solutions and uptake of results in the Danube macro region

The EU Strategy for the Danube region foresees that science and technology are a major driving force for the development of a knowledge based economy in this area. This project will explore and identify instruments and tools for enhancing research and innovation cooperation for the environment in this region at a more integrated and strategic level as well as for the exploitation of results by society and the economy, including policy makers. Synergies will be sought with programmes and projects funded by other EU instruments (e.g. Structural Funds) as well as by national or private sources. The project will identify future research and innovation needs and the ways and means to achieve responses. EU and nationally funded research and innovation projects related to the environment with high added value and relevance to the Danube region will be identified and clustered. Priority will be given to a consortium which can demonstrate knowledge of the research, innovation and institutional structures in the region. The selected proposal will be requested to ensure coordination and coherence with other relevant actions funded by FP7 and the future research and innovation programme, including INCO-2013-7.1, activity 7.1.3 (see the [International Cooperation Activities part of the Capacities Programme](#)).

g) Research partnerships to sustainably manage the biodiversity in EU Outermost Regions (OR) and Overseas Countries and Territories (OCT)

The Outermost Regions (OR) and Overseas Countries and Territories (OCT) of the European Union in tropical and sub-tropical regions are well-known hotspots of terrestrial, freshwater and marine biodiversity. According to previous research their geographical isolation, diverse direct human pressures, natural hazards and/or climate change contribute to the progressing decline of their extraordinarily rich biodiversity. Strong research partnerships need to be established or maintained among all relevant stakeholders, research funding bodies and policy makers in those regions to develop and apply sustainable management for biodiversity preservation in the OR and OCT as well as to assess the role of biodiversity in their economic, social and cultural development.

Funding scheme: Coordination and support action (coordinating action)

The requested EU contribution per project shall not exceed EUR 1 000 000.

Up to one proposal can be selected per sub-topic.

Expected impact:

a) Enhanced implementation of the 'Climate and Energy package (20/20/20 targets)⁶⁴ and the Roadmap for moving to a competitive low carbon economy in 2050⁶⁵. Strengthened EU

⁶⁴ See footnote 13.

⁶⁵ See footnote 10.

climate policy informed by forward-looking analysis and better understanding of consequences of different policies and climate regimes on economic sectors and European society as a whole. Increased stakeholders' understanding of the consequences of international climate regime and EU climate policies for European citizens, as well as enhanced awareness and public acceptance.

b) Overcome barriers in decision making and risk communication through innovative means; reconciliation of users' demands and knowledge supply; timely contribution to EU policy development.

c) Highly visible and effective capacity building efforts in the field of Earth Observation within local communities and authorities. Demonstrable economic development through the integration and exploitation of economic development initiatives and environmental Earth Observations. The quantifiable engagement of resource providers (e.g. donors, the financial sector, etc.). The creation of new and innovative products through the use of environmental Earth Observations.

d) Improve the conditions for a favourable framework for the development of raw materials in Europe. Contribution to the aims of the proposed European Innovation Partnership on 'Raw Materials'⁶⁶.

e) Better understanding of how new policies can be developed that have better acceptance by key stakeholder groups difficult to target with today's policy tools.

f) Mobilisation of all actors and resources from public (national or EU) and private sources for higher investment in research and innovation towards an efficient river-delta-coast-sea management in the Danube/Danube Delta/Black Sea region.

g) Enhanced implementation and impact of the EU Biodiversity Strategy⁶⁷ and the CBD Strategic Plan⁶⁸ through improved trans-regional research collaboration, accurate and timely joint reporting, multi-stakeholder dialogues and good practice guidelines for biodiversity preservation. Increased regional economic, social and cultural development in tropical and sub-tropical OR and OCT based on the benefits from high biodiversity.

ENV.2013.6.5-3 Exploiting the European Open Data Strategy to mobilise the use of environmental data and information – FP7-ENV-2013-two-stage

Opening up public sector data and information for re-use has a significant and currently untapped potential to act as an engine for innovation, growth and transparent governance. Exploiting Europe's Open Data Strategy can contribute to: decision-making in policy areas; fostering the participation of citizens in environmental governance; and generating new innovative products and services, which can lead to new businesses, jobs and growth.

Using open, readily accessible and freely available Earth Observation data and information, projects should enable wide access to scientific data to allow researchers in different domains to collaborate on the same data sets, to ensure seamless interoperability of data catalogues, to engage in entirely new forms of scientific research and to explore correlations between research results; then using models, innovative environmental tools and information products, based on accepted standards, deliver benefits to researchers, European end-user agencies, the industrial sector, policy makers, and citizens, across environmental knowledge domains.

⁶⁶ See footnote 39

⁶⁷ See footnote 20

⁶⁸ Convention on Biological Diversity, Strategic Plan for Biodiversity 2011-2020, COP 10 Decision No. X/2, see <http://www.cbd.int/decision/cop/?id=12268>

Attention should be focussed on sharing and exploiting data and information from many varied sources, including in particular: open public sector data portals, the programme on Global Monitoring for Environment and Security (GMES), the Global Earth Observation System of Systems (GEOSS) and especially the GEOSS Data-CORE.

Relevant European Strategies and Policies: EU 2020 Strategy; Digital Agenda for Europe – Open Data Strategy⁶⁹; INSPIRE⁷⁰; CIP⁷¹ to stimulate the emergence of new business.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 6 000 000.

One or more proposals can be selected.

Expected impact: The creation of opportunities in global markets, new businesses, jobs and growth, through the delivery of a wide range of innovative products and services; better evidence-based policy making and administrative efficiency at all levels of government, resulting in improved public services, e.g. the provision of information to address crisis situations and disasters with cross-boundary impact; greater transparency in public administration through the improved visibility of information, informing citizens and business about policies, public spending and outcomes; empowering citizens and citizens' associations, enabling them to contribute to environmental governance processes in the domains of transparency, knowledge management, accountability and responsiveness.

Additional eligibility criterion: Proposals will only be selected for funding if the estimated EU contribution going to SMEs is 30 % or more of the total requested EU contribution for the whole project. This will be re-assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

ENV.2013.6.5-4 Knowledge platforms, networking and uptake of research results for more strategic international R&I cooperation – FP7-ENV-2013-one-stage

The objectives are to establish sustainable research and innovation cooperation between main EU and third country actors and to enhance uptake of research results on subjects of mutual interest in the areas of climate action, resource efficiency and raw materials, as described in the Commission proposal for Horizon 2020⁷². Targeted regions are:

- a) Latin America⁷³,
- b) ASEAN,
- c) the Mediterranean⁷⁴ and the Black Sea,
- d) the North Atlantic.

Each proposal should address one targeted region only. EU funded projects with high added value and relevance to the regional needs will be identified and clustered. Clusters will bring together, through bilateral or bi-regional meetings, EU and third country researchers and other relevant stakeholders, aiming at the identification of tools and instruments for enhancing cooperation at a more strategic level and exploitation of results, including twinning of projects. The level of maturity of R&I relations with the EU, as well as cultural, political and

⁶⁹ http://ec.europa.eu/information_society/digital-agenda/index_en.htm

⁷⁰ Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE), PB L 108, 25.4.2007, p. 1.

⁷¹ Competitiveness and Innovation Framework Programme (CIP) <http://ec.europa.eu/cip/>

⁷² See footnote 4

⁷³ As defined in Annex 16 of the Cooperation work programme, List of International Cooperation Partner Countries (ICPC)

⁷⁴ See footnote 75

administrative differences affecting international R&I cooperation with respective regions should be taken into account. Synergies will be sought with projects funded by other EU instruments (external cooperation) or other parts of the Framework Programme (International Cooperation Activities in the Capacities Programme) and the consortium should build on their reports and recommendations. Consortia should include a sufficient number of eligible ICPC country partners or other international partners from the target regions to ensure adequate scale and scope of cooperation. Priority will be given to consortia which can ensure contacts with and sufficient additional financial commitment from research-related regional structures and/or national authorities or major research institutes in the region.

The final product will be concrete proposals for upgrading the joint research and innovation agenda at more strategic levels and linking major EU projects or clusters of them with projects/networks in the countries of the region and the potential users, such as policymakers and industry. It will also identify potential sources of funding (national, EU, international) other than FP7.

Funding scheme: Coordination and Support Action (coordinating action)

The requested EU contribution per project shall not exceed EUR 1 000 000.

Up to one proposal per region can be selected.

Expected impact: More strategic, integrated and sustainable research and innovation collaboration in the field of climate change, resource efficiency and raw materials between the EU and third countries from Latin America, ASEAN, the Mediterranean and the Black Sea, and the North Atlantic, by bringing the scientific communities and programmes closer to each other around specific challenges, linking their efforts and exploiting research results. Stimulation of future integrated and strategic cooperation activities, mobilisation of financial means from various sources and enhanced uptake and use of research and research results for meeting societal challenges in bi-regional and bilateral mutual priorities.

ENV.2013.6.5-5 Network for forward looking activities and assessment of research and innovation prospects – FP7-ENV-2013-one-stage

The aim is to establish a research and innovation policy support network of research institutes and other organisations including stakeholder organisations that may include think tanks, professional and industrial associations and policy analysts, as appropriate. The network will collect strategic information about medium and long term research and innovation trends and prospects, and will carry out forward looking analysis in the areas of climate action, resource efficiency and raw materials as described in the Commission proposal for Horizon 2020⁷⁵. It will analyse technology, policy and market developments as well as policies and programmes of major EU and third country research and innovation actors. In addition, the network will develop, propose and monitor indicators for assessing the impact (in terms of policy, economy, society, sustainability) of EU R&I cooperation both within the EU and with some selected third countries in the field of climate, resource efficiency and raw materials. It will develop a scoreboard of the implementation of European Research Area (ERA) in the specific area and its links with the Innovation Union strategy. It will produce regular quantitative and qualitative briefings with information, trends and strategic options for R&I addressed to EU research managers and policy makers on specific issues. Partners with experience in forward looking, horizon scanning, forecasting and in research policy impact assessment will be important assets for the consortium. Synergies and cooperation with other relevant FP7 activities should be ensured.

⁷⁵ See footnote 4

Funding scheme: Coordination and Support Action (coordinating action)

The requested EU contribution per project shall not exceed EUR 3 000 000.

Expected duration: 5 years

Up to one proposal can be selected.

Expected impact: Improved quality of R&I policies and programmes in the fields of climate action, resource efficiency and raw materials through substantiated evidence and trends. Improved impact of EU research and innovation on societies, policies and markets through advanced assessment of needs and developments. Improved European competitiveness and political leadership by early reaction to emerging trends, issues and opportunities.

ENV.2013.6.5-6 ERA-NET Plus action: Development of new methodologies, technologies and products for the assessment, protection and management of historical and modern artefacts, buildings and sites – ERANET-2013-RTD

The main aim of this ERA-NET Plus action is to pool the necessary financial resources from the participating national (or regional) research programmes and the European Union with a view to implement a single joint call for proposals for research projects in the cultural heritage field that will be evaluated and managed jointly by the participating programmes. The action should aim at the development of new methodologies, technologies and products for the assessment, protection and management of historical and modern artefacts, buildings and sites. It should help assess the impact of past, present and future environments on cultural heritage while considering social, economic and environmental sustainability strategies for the cultural heritage sector. Through an interdisciplinary approach, the joint call should clearly focus in priority on tangible cultural heritage research — while not excluding, when appropriate, interlinked aspects of digital and intangible heritage — and on the synergies derived from cooperation at a transnational level. The topics related to the joint call should be commensurate to the available funds to ensure a reasonable success rate.

This ERA-NET Plus action is aimed at improving the coordination of national research activities and policies in the domain of cultural heritage research. The EC contribution to the joint call budget serves as an incentive to achieve critical mass and a higher degree of integration. The overall subject of the call must be of major interest and ensure significant added value at European level.

Funding scheme: Coordination and support action (ERA-NET Plus).

The total EU contribution for this ERA-NET Plus action is limited to a maximum of 33 % of the total of cumulative joint call budget, up to a limit of EUR 4 million for the EU contribution. Complete and detailed information on funding scheme, special eligibility criteria and expected impact for ERA-NET Plus actions can be found in Annex IV of the cooperation work programme.

Up to one proposal can be selected.

Expected impact: Better use of scarce resources. Increased quality of research and synergies at European, national and regional level. Reduced fragmentation of research efforts.

Special features: A single joint call should be implemented with a clear prior financial commitment from the participants. Eligible participants are programme owners or programme managers that contribute to the call budget. A minimum of 5 participants from 5 different Member or Associated States providing funding is required. The minimum total budget of the joint call is EUR 5 million. Each project retained for funding should be transnational (i.e. with minimum 2 partners from different countries). Coordination experience between national programmes is a necessary prerequisite. Participation in this ERA-NET Plus action is open to

all Member States/Associated Countries within, and also beyond, the framework of the Joint Programming Initiative on 'Cultural Heritage and Global Change: a new challenge for Europe'.

III IMPLEMENTATION OF CALLS

For description of the topics of the calls, please refer to section II 'Content of calls'

Call title: ENVIRONMENT 2013: TWO-STAGE

- **Call identifier:** FP7-ENV-2013-two-stage
- **Date of publication:** 10 July 2012⁷⁶
- **Deadline:** First stage: 16 October 2012⁷⁷ at 17.00.00, Brussels local time
- **Indicative budget**⁷⁸: EUR 248 million

Table 1. Indicative budget breakdown by challenge/activity:

Challenge/activity	Indicative budget (EUR million)
6.1 Coping with climate change	80
6.2 Sustainable use and management of land and seas	73
6.3 Improving resource efficiency	49
6.4 Protecting citizens from environmental hazards	36
6.5 Mobilising environmental knowledge for policy, industry and society	10

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10 % of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10 % of the total value of the indicated budget for the call.

⁷⁶ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁷⁷ The Director-General responsible may delay this deadline by up to two months.

⁷⁸ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

• **Topics called for the FP7-ENV-2013-two-stage-call:**

Challenge	Topics called	Funding Schemes and eligibility criteria
<i>Challenge 6.1 Coping with climate change</i>	<i>ENV.2013. 6.1-1 Climate-related ocean processes and combined impacts of multiple stressors on the marine environment</i> <i>One or more proposals can be selected.</i>	<i>Collaborative Project</i> <i>The requested EU contribution per project shall not exceed EUR 9 000 000.</i>
	<i>ENV.2013.6.1-2 Atmospheric processes, eco-systems and climate change</i> <i>One or more proposals can be selected</i>	<i>Collaborative Project</i> <i>The requested EU contribution per project shall not exceed EUR 9 000 000.</i>
	<i>ENV.2013.6.1-3 Impacts of higher-end scenarios (global average warming > 2 °C with respect to pre-industrial level)</i> <i>One or more proposals can be selected.</i>	<i>Collaborative Project</i> <i>The requested EU contribution per project shall not exceed EUR 9 000 000.</i>
	<i>ENV.2013.6.1-4 Land cover and land-use change and climate change mitigation</i> <i>One or more proposals can be selected.</i>	<i>Collaborative Project</i> <i>The requested EU contribution per project shall not exceed EUR 6 000 000.</i>
	<i>ENV.2013.6.1-5 Quantification of consumption-based emissions of greenhouse gases and assessment of policy options</i> <i>Up to one proposal can be selected.</i>	<i>Collaborative Project</i> <i>The requested EU contribution per project shall not exceed EUR 3 000 000.</i>
	<i>ENV.2013.6.1-6 Economics of adaptation to climate change</i> <i>Up to one proposal can be selected.</i>	<i>Collaborative Project</i> <i>The requested EU contribution per project shall not exceed EUR 3 000 000.</i>
<i>Challenge 6.2 Sustainable use and management of land and seas</i>	<i>ENV.2013.6.2-1 Water resources management under complex, multi-stressor conditions</i> <i>One or more proposals can be selected.</i>	<i>Collaborative Project</i> <i>The requested EU contribution per project shall not exceed EUR 9 000 000.</i>
	<i>ENV.2013.6.2-2 Toxicants, environmental pollutants and land and water resources management</i> <i>Up to one proposal can be selected.</i>	<i>Collaborative Project</i> <i>The requested EU contribution per project shall not exceed EUR 12 000 000</i> <i>Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 15 % or more of the</i>

		<i>total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.</i>
	<i>ENV.2013.6.2-3 Transition to sustainable, low-carbon societies One or more proposals can be selected.</i>	<i>Collaborative Project The requested EU contribution per project shall not exceed EUR 3 000 000.</i>
	<i>ENV.2013.6.2-4 Sustainable land care in Europe One or more proposals can be selected.</i>	<i>Collaborative Project The requested EU contribution per project shall not exceed EUR 9 000 000. Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.</i>
	<i>ENV.2013.6.2-5 Urban biodiversity and green infrastructure Up to one proposal can be selected.</i>	<i>Collaborative Project The requested EU contribution shall not exceed EUR 6 000 000. Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.</i>
	<i>ENV.2013.6.2-6 Improved monitoring of the impact of cultivation on the environment using global Earth Observations Up to one proposal can be selected.</i>	<i>Collaborative Project The requested EU contribution per project shall not exceed EUR 9 000 000. Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will</i>

		<i>not be funded.</i>
	<p><i>ENV.2013.6.2-7 Development of advanced technologies and tools for mapping, diagnosing, protecting and managing cultural landscapes in rural areas</i></p> <p><i>Up to one proposal can be selected.</i></p>	<p><i>SME-targeted Collaborative Project</i></p> <p><i>The requested EU contribution shall not exceed EUR 3 000 000.</i></p> <p><i>Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 20 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.</i></p>
	<p><i>ENV.2013.6.2-8 Sustainable management of Europe's deep sea and sub-sea floor resources</i></p> <p><i>Up to one proposal can be selected.</i></p>	<p><i>Collaborative Project</i></p> <p><i>The requested EU contribution per project shall not exceed EUR 9 000 000.</i></p> <p><i>Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.</i></p>
Challenge 6.3	Improving resource efficiency	
	<p><i>ENV.2013.6.3-1 Turning waste into a resource through innovative technologies, processes and services</i></p> <p><i>One or more proposals can be selected.</i></p>	<p><i>SME-targeted Collaborative Project</i></p> <p><i>The requested EU contribution per project: (as appropriate, wide range expected from such a bottom up call).</i></p> <p><i>Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 30 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.</i></p>
	<p><i>ENV.2013.6.3-2 Eco-innovative demonstration projects</i></p> <p><i>One or more proposals can be selected.</i></p>	<p><i>SME-targeted Collaborative Project</i></p> <p><i>The requested EU contribution per project: (as appropriate, wide range expected from such a bottom up call).</i></p>

		<i>Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 30 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.</i>
	<i>ENV.2013.6.3-3 Contribution to the assessment of global water resources through the use of new Earth Observation datasets and techniques Up to one proposal can be selected.</i>	<i>Collaborative Project The requested EU contribution per project shall not exceed EUR 9 000 000. Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.</i>
<i>Challenge 6.4 Protecting citizens from environmental hazards</i>	<i>ENV.2013.6.4-1 Assessing individual exposure to environmental stressors and predicting health outcomes: paving the way for an EU-wide assessment Up to one proposal can be selected.</i>	<i>Collaborative Project The requested EU contribution per project shall not exceed EUR 12 000 000.</i>
	<i>ENV.2013.6.4-2 Closing gaps of knowledge and reducing exposure to electromagnetic fields (EMF) Up to one proposal can be selected.</i>	<i>Collaborative Project The requested EU contribution per project shall not exceed EUR 6 000 000.</i>
	<i>ENV.2013.6.4-3 Coasts at threat in Europe: tsunamis and climate-related risks One or more proposals can be selected.</i>	<i>Collaborative Project The requested EU contribution per project shall not exceed EUR 6 000 000.</i>
	<i>ENV.2013.6.4-4 Towards stress test for critical infrastructures against natural hazards One or more proposals can be selected.</i>	<i>Collaborative Project The requested EU contribution per project shall not exceed EUR 3 000 000.</i>

<p><i>Challenge 6.5 Mobilising environmental knowledge for policy, industry and society</i></p>	<p><i>ENV.2013.6.5-3 Exploiting the European Open Data Strategy to mobilise the use of environmental data and information</i></p> <p><i>One or more proposals can be selected.</i></p>	<p><i>Collaborative Project</i></p> <p><i>The requested EU contribution per project shall not exceed EUR 6 000 000.</i></p> <p><i>Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 30 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.</i></p>
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• **Eligibility conditions:**

- The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- Table of standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation and in the below format:

Funding scheme	Minimum conditions
Collaborative Project/SME-targeted Collaborative Project	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC

- The eligibility criteria apply to both first and second stage proposals. At stage 1, only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds, while part B will be used to check the number of eligible participants. At stage 2, part A will be used alone to determine these eligibility conditions.

The following additional eligibility conditions apply in this call:

- It is important to note that the upper limits for requested EU contribution given per topic will be applied as an additional eligibility criterion and those proposals which do not respect these limits will be considered as ineligible.
- At stage 2, for topics ENV.2013.6.2-2, ENV.2013.6.2-4, ENV.2013.6.2-5, ENV.2013.6.2-6, ENV.2013.6.2-8, and ENV.2013.6.3-3 the following additional eligibility criterion will be applied: Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

- At stage 2, for topic ENV.2013.6.2-7, the following additional eligibility criterion will be applied: Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 20 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.
- At stage 2, for topics ENV.2013.6.3-1, ENV.2013.6.3-2 and ENV.2013.6.5-3 the following additional eligibility criterion will be applied: Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 30 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

- **Evaluation procedure:**

- The evaluation criteria and scoring scheme are set out in annex 2 of the work programme.
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

The Commission will instruct the experts to disregard any pages exceeding these limits.

The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).

- A two-stage submission and evaluation procedure will be used.
- Experts will carry out the individual evaluation of proposals remotely.
- The procedure for prioritising proposals with equal scores is described in annex 2 of the Cooperation work programme.
- A ranked list will be drawn up for each indicative budget shown in the call fiche.

Additional information regarding evaluation criteria and procedures:

- Stage 1 proposals shall be submitted by the closure date mentioned above 16/10/2012 at 17:00.00, Brussels, local time. For successful stage 1 proposals, instead of an *Evaluation Summary Report* coordinators will receive an invitation to submit their full proposal. The closure date of the stage 2 submission will be specified in the invitation to submit the complete proposal. The indicative closure date for stage 2 is 28/02/2013 at 17:00.00, Brussels, local time.
- Stage 1 proposals are evaluated on the basis of their **S/T quality** and **Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of 0.5 point scores. Successful proposals must pass the minimum thresholds as follows:

STAGE 1	Minimum threshold
S/T quality	4/5
Impact	3/5
Overall threshold	8/10

- Only proposals that will pass all thresholds will be invited to present a full proposal for Stage 2.
- Stage 2 proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of 0.5 point scores. Successful proposals must pass the minimum thresholds as follows:

STAGE 2	Minimum threshold
S/T quality	4/5
Implementation	3/5
Impact	3/5
Overall threshold	11/15

- **Indicative timetable:** The stage 1 evaluation should be finalised in mid December 2012. The evaluation of the stage 2 is expected to take place in March/April 2013. Overall evaluations results are estimated to be available within 3 months after the closure date for stage 2 proposals. It is expected that grant agreement negotiations for short-listed proposals will begin in May/June 2013.
- **Consortia agreements** In line with the Rules for Participation and the Model Grant Agreement, participants in Collaborative Projects are required to conclude a consortium agreement prior to grant agreement.
- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.
- **Flat rates to cover subsistence costs:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.
- **Dissemination:** Grant agreements of projects financed under this call for proposals will include the special clause 39 on the 'Open access pilot in FP7'. This includes the obligation on beneficiaries to ensure free access to peer-reviewed articles resulting from projects via an institutional or subject-based repository.

Call title: ENVIRONMENT 2013: ONE-STAGE

- **Call identifier:** FP7-ENV-2013-one-stage
- **Date of publication:** 10 July 2012⁷⁹
- **Deadline:** 16 October 2012⁸⁰ at 17.00.00, Brussels local time
- **Indicative budget**⁸¹: EUR 17 million

Table 1. Indicative budget breakdown by challenge/activity:

Challenge/activity	Indicative budget (EUR million)
6.1 Coping with climate change	n/a
6.2 Sustainable use and management of land and seas	n/a
6.3 Improving resource efficiency	n/a
6.4 Protecting citizens from environmental hazards	n/a
6.5 Mobilising environmental knowledge for policy, industry and society	17

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10 % of the total value of the indicated budget for each call; and
 - Any repartition of the call budget may also vary by up to 10 % of the total value of the indicated budget for the call.
- **Topics called for the FP7-ENV-2013-one-stage-call:**

⁷⁹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁸⁰ The Director-General responsible may delay this deadline by up to two months.

⁸¹ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

Challenge	Topics called	Funding Schemes and eligibility criteria
<i>Challenge 6.5 Mobilising environmental knowledge for policy, industry and society</i>	<i>ENV.2013.6.5-1 Accelerating progress towards the Green Economy Up to one proposal can be selected per sub-topic.</i>	<i>Coordination and Support Action (coordinating action) The requested EU contribution per project shall not exceed EUR 1 000 000.</i>
	<i>ENV.2013.6.5-2 Mobilising environmental knowledge for policy and society Up to one proposal can be selected per sub-topic.</i>	<i>Coordination and support action (coordinating action). The requested EU contribution per project shall not exceed EUR 1 000 000.</i>
	<i>ENV.2013.6.5-4 Knowledge platforms, networking and uptake of research results for strengthened international R&I cooperation Up to one proposal can be selected per region.</i>	<i>Coordination and Support Action (coordinating action) The requested EU contribution per project shall not exceed EUR 1 000 000.</i>
	<i>ENV.2013.6.5-5 Network for forward looking activities and assessment of research and innovation prospects Up to one proposal can be selected.</i>	<i>Coordination and Support Action (coordinating action) The requested EU contribution per project shall not exceed EUR 3 000 000. Expected duration: 5 years.</i>

• **Eligibility conditions:**

- The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- Table of standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation and in the below format:

Funding scheme	Minimum conditions
Coordination and Support Actions (coordinating action)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The following additional eligibility conditions apply in this call:

- It is important to note that the upper limits for requested EU contribution given per topic will be applied as an additional eligibility criterion and those proposals which do not respect these limits will be considered as ineligible.

- **Evaluation procedure:**

- The evaluation criteria and scoring scheme are set out in annex 2 of the work programme.
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

The Commission will instruct the experts to disregard any pages exceeding these limits.

The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).

- Experts will carry out the individual evaluation of proposals remotely.
- The procedure for prioritising proposals with equal scores is described in annex 2 of the Cooperation work programme.
- A ranked list will be drawn up for each indicative budget shown in the call fiche.
- The evaluation shall follow a one stage evaluation procedure. Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of 0.5 point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold	10/15

- **Indicative timetable:** Evaluations are expected to be carried out during the months of November and December 2012. It is expected that the grant agreement negotiations for short-listed proposals will begin in January 2013.
- **Consortia agreements** In line with the Rules for Participation and the Model Grant Agreement, participants in Collaborative Projects are required to conclude a consortium agreement prior to grant agreement.
- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Flat rates to cover subsistence costs:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.
- **Dissemination:** Grant agreements of projects financed under this call for proposals will include the special clause 39 on the 'Open access pilot in FP7'. This includes the obligation on beneficiaries to ensure free access to peer-reviewed articles resulting from projects via an institutional or subject-based repository.

Call title: ENVIRONMENT 2013-WATER-INNO-DEMO

- **Call identifier:** FP7-ENV-2013-WATER-INNO-DEMO
- **Date of publication:** 10 July 2012⁸²
- **Deadline:** 4 April 2013⁸³ at 17.00.00, Brussels local time
- **Indicative budget**⁸⁴: EUR 40 million

Table 1. Indicative budget breakdown by challenge/activity:

Challenge/activity	Indicative budget (EUR million)
6.1 Coping with climate change	n/a
6.2 Sustainable use and management of land and seas	n/a
6.3 Improving resource efficiency	40
6.4 Protecting citizens from environmental hazards	n/a
6.5 Mobilising environmental knowledge for policy, industry and society	n/a

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10 % of the total value of the indicated budget for each call; and
 - Any repartition of the call budget may also vary by up to 10 % of the total value of the indicated budget for the call.
- **Topics called for the FP7-ENV-2013-WATER-INNO-DEMO-call:**

⁸² The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

⁸³ The Director-General responsible may delay this deadline by up to two months.

⁸⁴ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

Challenge	Topics called	Funding Schemes and eligibility criteria
<i>Challenge 6.3 Improving resource efficiency</i>	<i>ENV.2013.WATER INNO&DEMO-1 Water innovation demonstration projects One or more proposals can be selected.</i>	<i>SME-targeted Collaborative Project The requested EU contribution per project shall not exceed EUR 6 000 000. Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 30 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.</i>
	<i>ENV.2013.WATER INNO&DEMO-2 Ensuring the integration of water and innovation demonstration projects and support to trans-national networks of procurers Up to one proposal can be selected for each sub-topic.</i>	<i>Coordination and support action (coordinating action) The requested EU contribution per project shall not exceed EUR 1 000 000.</i>

• **Eligibility conditions:**

- The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- Table of standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation and in the below format:

Funding scheme	Minimum conditions
Collaborative Project/SME-targeted Collaborative Project	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (coordinating action)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The following additional eligibility conditions apply in this call:

- It is important to note that the upper limits for requested EU contribution given per topic will be applied as an additional eligibility criterion and those proposals which do not respect these limits will be considered as ineligible.
- For topic ENV.2013.WATER INNO&DEMO-1, the following additional eligibility criterion will be applied: Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 30 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

• **Evaluation procedure:**

- The evaluation criteria and scoring scheme are set out in annex 2 of the work programme.
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission..

The Commission will instruct the experts to disregard any pages exceeding these limits.

The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).

- Experts will carry out the individual evaluation of proposals remotely.
- The procedure for prioritising proposals with equal scores is described in annex 2 of the Cooperation work programme.
- A ranked list will be drawn up for each indicative budget shown in the call fiche.
- The evaluation shall follow a one stage evaluation procedure. Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of 0.5 point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold	10/15

- **Indicative timetable:** Evaluations are expected to be carried out during the months of April and May 2013. It is expected that the grant agreement negotiations for short-listed proposals will begin in June 2013.

- **Consortia agreements** In line with the Rules for Participation and the Model Grant Agreement, participants in Collaborative Projects are required to conclude a consortium agreement prior to grant agreement.
- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.
- **Flat rates to cover subsistence costs:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.
- **Dissemination:** Grant agreements of projects financed under this call for proposals will include the special clause 39 on the 'Open access pilot in FP7'. This includes the obligation on beneficiaries to ensure free access to peer-reviewed articles resulting from projects via an institutional or subject-based repository.

IV OTHER ACTIONS ⁸⁵

The 'Environment' Theme will comply with the prevailing requirements for monitoring, and evaluation, both ex-ante and ex-post. New innovative ideas for implementation activities will be explored with a view to paving the way for Horizon 2020, including a feasibility study to explore ways to introduce an EU inducement prize for women in the interdisciplinary research fields of climate action, resource efficiency and raw materials. These actions may also involve studies and surveys as appropriate implemented through public procurement, and/or appointing groups of experts. The overall commitment appropriations for this Activity in 2013 will be up to EUR 650 000 of which maximum EUR 400 000 for public procurement.

Preparatory Action

- Feasibility study to explore ways and means to introduce, under Horizon 2020⁸⁶, an EU inducement prize for women in the interdisciplinary research fields of climate action, resource efficiency and raw materials.

The advancement of a green economy encompasses societal and institutional changes as much as the development of new technologies, processes, services, methodologies and behaviours. Equal participation of men and women is essential for Europe to exploit the full potential of innovative strengths. Moreover, studies show that in this field women are key actors in innovation, both technological and social, including community based management.

The purpose of this study is to assess how to raise awareness of the crucial role that women and gender play in innovation to achieve sustainable development and management. The study should explore how a prize can stimulate European women to propose innovative solutions both in the European and international context to support sustainable development and management. The study will also advise the Commission on the feasibility, design and management aspects of a potential prize. A group of experts may also be established.

The indicative budget for this public procurement activity will be up to EUR 150 000.

Funding scheme: CSA, public procurement, experts appointment

Monitoring and Evaluation

- ex-post evaluation of FP7 funded research in the field of environmental (including climate change) research. This study will be subject to contract following a public procurement procedure. If appropriate a Commission Framework Contract will be utilised. A group of experts may also be established.

The indicative budget for this public procurement activity will be up to EUR 250 000.

Funding scheme: CSA, public procurement, experts appointment

⁸⁵ In accordance with Articles 14, 17 and 27 of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

⁸⁶ See footnote 4

- Group(s) of external experts for policy relevant analyses and forward looking reflection on environment related research. Group(s) of external experts will be established to provide analyses of past activities in policy relevant areas, assess policy relevant state-of-the-art scientific knowledge and to engage in a forward looking reflection on issues related to future environment related research and innovation.
The indicative budget for this activity is EUR 250 000.
Funding scheme: CSA, experts appointment

Subscription

- An annual contribution to the 2013 activities of the Global Earth Observation (GEO) Secretariat ⁸⁷, as subscription to a body of which they are a member, according to Article 108(2)(d) of the Financial Regulation applicable to the general budget of the European Communities.
As a full member of GEO the Commission will pay on behalf of the Union a 2013 contribution of EUR 600 000 to the GEO Trust Fund which is the budgetary structure agreed by the GEO members to fund the GEO secretariat (hosted by the World Meteorological Organisation in Geneva, Switzerland).
Funding scheme: other action
Expected impact: To ensure the implementation of the GEOSS according to its annual work plan and the continuity of the leadership and participation of Europe in GEO.

Independent expertise

- The use of appointed experts for the evaluation of project proposals (EUR 2 000 000) and, where appropriate, for the reviewing of running projects (EUR 400 000).
The indicative budget for independent expertise is EUR 2 400 000.
Funding scheme: CSA, experts appointment

⁸⁷ Contribution paid by the Union as subscription to a body of which they are a member, according to Article 108(2)(d) of the Financial Regulation applicable to the general budget of the European Communities.

V BUDGET

Theme Environment (including climate change) — Indicative budget

Activities	2013⁸⁸ Budget EUR million⁸⁹
Call FP7-ENV-2013-one-stage	17.00
Call FP7-ENV-2013-two-stage	248.00
Call FP7-ENV-2013-WATER-INNO-DEMO	40.00
Call FP7-OCEAN-2013 ⁹⁰	15.00
Call ERANET-2013-RTD ⁹¹	4.00
Call FP7-2013-NMP-ENV-EeB ⁹²	6.00
General activities (cf Annex 4) (details below)	2.86
Other actions: <ul style="list-style-type: none"> • Evaluations (EUR 2.00 million) • Monitoring and reviews (EUR 0.4 million) • Actions implemented through public procurements, expert groups and subscription (EUR 1.25 million) 	3.65
Estimated total budget	336.51

⁸⁸ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

⁸⁹ The Budget figures given in this table are rounded to two decimal places.

⁹⁰ "The Ocean of Tomorrow 2013": joining research forces to meet challenges in ocean management" call fiche with all relevant information can be found in the Work programme of Theme 2 Food, Agriculture, Fisheries and Biotechnology (FAFB), as well as on the Participant Portal under the call page FP7-OCEAN-2013.

⁹¹ For further details of the implementation of this call, please see Annex 4 of the Cooperation work programme.

⁹² For further details of the implementation of this call, please see Annex 5 of the Cooperation work programme.

General activities - indicative budget

Activities	2013⁹³ Budget EUR
CORDIS	447 694
Expertise for the evaluation and review of horizontal activities	5 667
EUREKA and Research Organisations	22 668
COST	2 382 322
Total	2 858 351

All budgetary figures given in this work programme are indicative. The final budgets may vary following the evaluation of proposals.

The final budget awarded to actions implemented through calls for proposals may vary:

- The total budget of the call may vary by up to 10 % of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10 % of the total value of the indicated budget for the call.

For actions not implemented through calls for proposals:

- The final budgets for evaluation, monitoring and review may vary by up to 20 % of the indicated budgets for these actions;
- The final budget awarded for all other actions not implemented through calls for proposals may vary by up to 10 % of the indicated budget for these actions.

⁹³ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

WORK PROGRAMME 2013

COOPERATION

THEME 7

TRANSPORT (INCLUDING AERONAUTICS)

(European Commission C(2012)4536 of 09 July 2012)

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7. TRANSPORT (INCLUDING AERONAUTICS)

Objective

Based on technological and operational advances and on the European transport policy, develop integrated, safer, “greener” and “smarter” pan-European transport systems for the benefit of all citizens and society and climate policy, respecting the environment and natural resources; and securing and further developing the competitiveness attained by the European industries in the global market.

I.0. CONTEXT

Against the backdrop of the current economic situation and increased global competition, the Union has defined a strategy to support growth and job creation, Europe 2020. The Innovation Union Flagship initiative supports this strategy through specific commitments. Research and innovation are key drivers of competitiveness, jobs, sustainable growth and social progress.

The work programme 2013 aligns with, and contributes towards, the objectives of Europe 2020, the Innovation Union Flagship, and other EU policies. There is a determined focus on fostering new ideas, supporting world class teams tackling significant societal challenges, and on ensuring that the fruits of our investments can be properly exploited.

In this way the work programme provides for a smooth transition towards the new research and innovation programme for 2014-2020, Horizon 2020.

I.0.1. Political landscape

European transport research and innovation (R&I) have a role to maintain and increase the efficiency of the different transport modes as well as their interaction and to foster progress. Technological progress, the organisation of transport and understanding the supply and demand factors are key elements in European transport R&I. The European transport system serves key roles in the transportation of people and goods in a local, regional, national, European and international context. At the same time, it is essential to Europe’s prosperity and closely linked to economic growth and quality of life. The grand challenge for Transport is to make growth and sustainability compatible, by decoupling environmental impacts from economic growth, while assuring the competitiveness and innovative character of the European transport industry. Economic crisis, increasing scarcity of non-renewable energy sources, aging, migration and internal mobility, urbanisation, and globalisation of the economy are among the other challenges to be faced by Transport research.

In the *Political guidelines of President Barroso* for the next Commission¹, it is stated that “the next Commission needs to maintain the momentum towards a low emission economy, and in particular towards decarbonising our electricity supply and the transport sector – all transport, including maritime transport and aviation, as well as the development of clean and electric cars. Decarbonising electricity supply and transport will also bring additional benefits in terms of security of energy supply”.

¹ Political guidelines for the next Commission, José Manuel Barroso, 3 September 2009.

The Commission Communication *'Europe 2020 – A strategy for smart, sustainable and inclusive growth'*² emphasises that essential elements of the transport policy are better integration of transport networks, promoting clean technologies, and upgrading infrastructure. Four of the flagship initiatives of this strategy, *'Innovation Union'*³, *'Resource efficient Europe'*⁴, *'A digital agenda for Europe'*⁵ and *'An industrial policy for the globalisation era'*⁶ are of particular relevance to Transport research. The concept of the Innovation Union recognises the need of strengthening the innovation chain today by launching a new approach, the European Innovation Partnerships, which will pool efforts and expertise in R&I to focus on results, outcomes and impacts, and rapid modernisation in key transport-related areas such as cities and mobility. Concentrating on growth enhancement and job creation is also an urgent measure as stated by the European Council on 30 January 2012⁷. Further, a New White Paper on Transport has been adopted by the Commission on 28 March 2011⁸, which lays down a long-term strategy that would allow the transport sector to meet its goals with a 2050 horizon.

R&I priorities outlined in this annual work programme are based on the above policy framework as well as on the overall objectives and research activities defined in the Specific Programme 'Cooperation' of the Seventh Framework Programme. Other European Union policies are also of relevance for Transport R&I. Following the adoption by the Commission of the *'European Economic Recovery Plan'* on 26 November 2008⁹, a *'European Green Cars Initiative (EGCI)'* has been launched involving R&I on a broad range of technologies and smart energy infrastructures essential to achieve a breakthrough in the use of renewable and non-polluting energy sources, safety and traffic fluidity. The initiative is funded by the European Union, the European Investment Bank (EIB), industry and Member States. It is worth to mention as well the Sustainable Development Strategy, the Marine and Maritime Research Strategy, the European Road Safety Action Programme 2011-2020, the European Agenda for Freight Logistics, the establishment of the European Maritime Transport Area without barriers, the EU Maritime Transport Strategy 2018, the ITS Directive and its Action Plan, the Action Plan on Urban Mobility, and a European strategy on clean and energy efficient vehicles.

Over recent years, the transport industry has changed under the impact of the internal market and of globalisation. Transport is a high-technology industry, making R&I crucial to its further development and conducive to European competitiveness, environmental and social agendas. The European Technology Platforms set up in the Transport sectors (ACARE for aeronautics and air transport, ERRAC for rail transport, ERTRAC for road transport, and WATERBORNE for waterborne transport) have elaborated long-term visions and strategic research agendas which constitute useful inputs that complement those from the Transport Advisory Group and the EGCI Advisory Group to the approach and activities of the Transport theme and the needs of policy makers and expectations of society.

² COM(2010) 2020 final

³ COM(2010) 546 final

⁴ COM(2011) 21; COM(2011) 571 final

⁵ COM(2010) 245 final/2

⁶ COM(2010) 614

⁷ "Towards growth-friendly consolidation and job-friendly growth", Statement of the Members of the European Council, 30 January 2012.

⁸ COM(2011) 144 final

⁹ COM (2008) 800

I.0.2. Approach for 2013

A revised approach has been adopted for Work Programme 2013 (WP 2013), reflecting the new political context and the priority given to the Innovation Union. This revised approach is based on focusing on major socio-economic challenges and responding to societal concerns. The work programme is structured accordingly to these challenges and addresses the innovation cycle in its integrity, while respecting the rules of competition (see below in section I.0.3 the innovation dimension of the activities).

The Transport theme takes a holistic ‘transport system’ approach in addressing the challenges and the innovation dimension, by considering the interactions of vehicles or vessels, networks or infrastructures and the use of transport services. Such an approach will necessitate the integration and demonstration of new concepts, knowledge and technologies, and the support to bringing them to the market within a socio-economic and policy context. Given the different structure and focus of the sectors, the theme is divided into three sub-themes (accordingly with the Specific Programme) and socio-economic research and cross-cutting issues:

- 7.1. AERONAUTICS and AIR TRANSPORT (AAT)
- 7.2. SUSTAINABLE SURFACE TRANSPORT (SST) including the ‘European Green Cars Initiative’
- 7.3. SOCIO-ECONOMIC RESEARCH and CROSS-CUTTING ISSUES
- 7.4. GALILEO

For the period 2012-13, a multi-annual strategy is proposed focusing on the above new approach. Work Programme 2013 will be the last one of FP7 and a smooth transition towards the future EU research and innovation funding should also be ensured.

Based on the policy context, to achieve critical mass, leverage effect and EU added-value, the **strategic research and specific objectives for WP 2013** will focus on three major socio-economic challenges:

- 1. Eco-innovation** – The decarbonisation of the transport system¹⁰ and an efficient use of natural resources¹¹, i.e. eco-innovation in all transport modes, greater energy efficiency, and the further development of clean vehicles and vessels.
- 2. Safe and seamless mobility** – The optimisation of the global efficiency, safety and security of the transport system (by application of intelligent transport systems and logistics), making efficient use of infrastructure and network capacity, with the aim of offering safe and seamless transport and mobility to all European citizens, as transport is also crucial for social inclusion.
- 3. Competitiveness and growth through innovation** – The strengthening of the competitiveness of European transport industry and job-friendly growth through

¹⁰ Transport is the only sector in which CO₂ emissions keep growing.

¹¹ The increasing scarcity of fossil fuels makes the transport sector with 97% oil dependency particularly vulnerable.

innovation, as competition from developed and emerging economies is intensifying in a global economy.

A thorough approach has been taken in order to select the most promising technology areas and innovation prospects to attain the three major challenges mentioned above. It takes into account the consultations with other Commission services, the Transport Advisory Group, MS/AS and stakeholders (including the Transport Technology Platforms of the four transport modes; and the EGCI Advisory Group), which ensure the added-value at EU level, ERA dimension and complementarity with national programmes and synergies of the activities and topics proposed. The results of previous calls (2007 to 2012) have also been considered when making the present proposal. The synergies between the sub-themes and their contribution to responding to the societal challenges of the Transport system will be exploited, as appropriate.

Also, this work programme contributes to priority themes or big tickets identified for 2013, particularly to the following ones:

- **Oceans of the future:** A new ‘The Ocean of Tomorrow’ joint call will be launched in collaboration with other RTD Directorates: Food, Agriculture, Fisheries and Biotechnologies (RTD/E), Environment (RTD/I), Transport (RTD/H), Energy (RTD/K) and Industrial Technologies - NMP (RTD/G) to promote research and innovation on marine technologies, in particular sensors, antifouling materials, and innovative transport and deployment systems for the offshore energy sector. The following topics are part of the joint call and will make a major contribution from the Transport theme:

OCEAN 2013.3: Innovative antifouling materials for maritime applications.

OCEAN 2013.4: Innovative transport and deployment systems for the offshore wind energy sector.

- **Smart Cities and Communities:** This initiative encompasses a broad range of topics related to energy production, distribution and use, urban mobility and enabling information and communication technologies. The Work Programme 2013 of the Transport Theme addresses some aspects of potential relevance for the Smart Cities and Communities Initiative; more specifically, the following two topics of the European Green Cars Initiative can be seen as contributing to the objectives of the Initiative:

GC.SST.2013-1: Feasibility analysis and technological development of on-road charging for long term electric vehicle range extension.

GC.SST.2013-4: Demonstration of electric buses as urban public transport.

A common structure of Challenges / Activities / Topics has been adopted for the sub-themes. The specificities of each sub-theme are provided in detail in the 'Context' sections of the sub-themes (sections I.1 and I.2).

The 2013 work programme has the following calls:

- FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-1
- FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-L0
- FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-RUSSIA

- FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-HIGH SPEED
- FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2013-RTD-1 (including the 'European Green Cars Initiative')
- 'The Ocean of Tomorrow 2013' (FP7-OCEAN-2013)
- FP7-TRANSPORT-2013-MOVE-1

For budgetary reasons, there will be no calls for *Galileo* in Transport Work Programme 2013 (see section 7.4).

a) Innovation dimension of the activities and bridging towards Horizon 2020

The Transport programme is intrinsically industrial/service oriented and its final target is to bring innovative products and services to the market to meeting the socio-economic challenges, promoting growth and creating jobs. Supporting innovation in the short, medium and long-term is underpinning all topics proposed in the Transport work programme for 2013.

Aeronautics and Air Transport (AAT)

Innovation and sustainable growth in AAT is being promoted by a coherent set of R&I actions at various levels of technology readiness going from future technologies (Level-0 – open for the second time in FP7-AAT) via upstream research on specific technologies (Level-1) to technology integration, demonstration and validation (Level-2) and final demonstrators in the appropriate operational environment (Level-3: "Clean Sky" and SESAR). From research and technology development to market, all actors will be present in project partnerships. The key industrial participants are expected to bring innovative products and services to the market, particularly in downstream research, and promote job-friendly growth. In particular, Level 2 projects will be requested to address the innovation phase (obstacles to exploitation, aspects related to certification, etc.).

To address challenges 1 (decarbonisation and eco-innovation) and 3 (competitiveness), upstream research (Level-1) focus mainly on the following activities: 'The greening of air transport' and 'Improving cost efficiency'. The other activities, particularly 'Increasing time efficiency', 'Ensuring customer satisfaction and safety', and 'Protection of aircraft and passengers' (all three related to challenge 2) are open for a limited number of topics selected from the gap analysis of previous calls and ensuring complementarity with research undertaken in Level-2 and Level-0.

WP 2013 put particular emphasis on technology integration (Level-2) in order to strike an equal balance between focussed projects and integrated projects over the entire duration of FP7. Topics for addressing the three challenges mentioned above have been selected, complementing the demonstration work in the Clean Sky's Integrated Technology Demonstrators and SESAR, and taking into account the availability at the time of the call of the underpinning technologies from previous research at lower technology readiness levels.

Sustainable Surface Transport (SST) including the 'European Green Cars Initiative (EGCI)'

Innovation and sustainable growth will be promoted by following a similar approach to AAT, i.e. balancing upstream and downstream components of the supply/demand side of innovation and ensuring adequate partnerships. Many topics involve demonstration, standardisation, certification, regulatory and/or other activities to promote innovation and job-friendly growth (see list below). Of particular importance is the *European Green Cars Initiative*, where most topics have a strong innovation character.

The 'European Green Cars Initiative' Private-Public Partnership – The three components of the EGCI are covered in Work Programme 2013: 1) development of electric vehicles for road transport; 2) medium and long distance road transport; and 3) logistics and co-modality, in line with the roadmaps adopted by the Industrial Advisory Group of the PPP. These three components underpin the R&I needed to address the three socio-economic challenges (i.e. eco-innovation, seamless transport and mobility for all, and global competitiveness).

Increasing railway attractiveness, efficiency and capacity – The Transport White Paper sets the goal that 30% of road freight over 300 km should shift to rail (or waterborne) by 2030 and more than 50% by 2050. The majority of medium-distance passenger transport (up to 1000 km) should go by rail in 2050. The Strategic Research Agenda 2020 of ERRAC includes targets to increase overall rail passenger transport by 40% compared to 2000. In line with this policy framework, railway R&I in WP 2013 focuses on contributing to safe and seamless mobility by focusing on train control systems, and railway infrastructure and operation, while taking also into account eco-innovation and competitiveness aspects such as noise reduction and certification of new materials for railway rolling stock.

Improving the efficiency of waterborne transport – R&I on waterborne technologies addresses all three societal challenges. The focus of WP 2013 will be on the reduction of ship emissions through energy systems integration, on safety aspects of ships in operation and risk management, and on strengthening competitiveness by focusing on innovative vessel designs and automatic manufacturing techniques. WP 2013 will also contribute to cross-thematic marine and maritime research (“The Ocean of Tomorrow 2013”), as mentioned above.

Urban transport, ITS, safety and road infrastructure – R&I topics on these areas are included in WP 2013 to address the three challenges, particularly on managing integrated multimodal urban transport networks, on capitalising CIVITAS¹² knowledge and experience, on virtual testing to design innovative vehicle safety systems, and on advanced materials and cost-effective construction and maintenance for greener, safer and reliable road infrastructure.

Innovation measures

This work programme contains innovation measures in support of activities closer to market such as support to market-uptake, notably through more activities aimed at generating knowledge to deliver new and more innovative products, processes and services. A list of innovation-related topics (AAT and SST) is presented below summarising those involving explicitly demonstration, standardisation, certification, regulatory and/or other issues

¹² The CIVITAS Initiative ("City-Vitality-Sustainability" or "Cleaner and Better Transport in Cities") was launched in 2002 (<http://www.civitas-initiative.org/index.php?id=4>)

addressed to fostering innovation and job-friendly growth. The list is not exhaustive. Many other topics not listed here are also implicitly underpinning innovation in the medium or long-term (e.g. all Level-1 topics in AAT).

The involvement of industry and service enterprises in project consortia including SMEs goes beyond 50% on average, which contributes to a great extent to an efficient exploitation of results and their take-up by the market.

In addition, specific recommendations are made in many topics to identify bottlenecks preventing innovation. It has to be emphasised that many of these topics will be implemented by large scale projects involving a large amount of financial resources, and coordination and support actions targeted to innovation-related issues.

List of topics with aspects related to demonstration, standardisation, certification, regulation, market take-up and/or other issues to fostering innovation and growth

SOCIO-ECONOMIC CHALLENGES	TOPICS	Funding scheme (1)	Demonstration (2)	Std./Cert./Reg.	Market take-up (3)	Other innovation aspects (4)
Eco-innovation	AAT.2013.1-2. Aerostructures	CP-FP		Yes		
	AAT.2013.1-3. Low pressure system for Ultra High By-Pass Ratio Engine	CP-IP	Yes	Yes	Yes	
	AAT.2013.1-4. Maturation of an integrated set of active flow, load and noise control technologies for the next generation of active wing, including in-flight demonstration	CP-IP	Yes	Yes	Yes	
	SST.2013.1-1. Railway infrastructure optimisation and monitoring for further noise reduction	CP-FP	Yes	Yes		
	SST.2013.1-2. Towards the zero emission ship	CP			Yes	Yes
	SST.2013.1-3. ERA-NET Plus ‘Advanced systems, materials and techniques for next generation infrastructure’	CSA-CA	Yes			Yes
	GC.SST.2013-1.Feasibility analysis and technological development of on-road charging for long term electric vehicle range extension	CP	Yes	Yes	Yes	

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	GC.SST.2013-3. Future light urban electric vehicles	CP-FP	Yes	Yes	Yes	
	GC.SST.2013-4. Demonstration of electric buses as urban public transport	CP	Yes	Yes	Yes	Yes
	GC.SST.2013-5. Configurable and adaptable truck	CP	Yes	Yes		
	GC.SST.2013-6. High efficiency energy conversion for future heavy duty transport	CP-FP	Yes			
	GC.SST.2013-7. Technical and operational connectivity in intermodal freight transport	CP-FP	Yes		Yes	Yes
	OCEAN 2013.3. Innovative antifouling materials for maritime applications	CP	Yes	Yes	Yes	Yes
	OCEAN 2013.4. Innovative transport and deployment systems for the offshore wind energy sector	CP	Yes		Yes	
Safe and seamless mobility	AAT.2013.3-1. Human factors	CP-FP				Yes
	SST.2013.2-1. Next generation of train control systems in the domain of urban and main line European railway systems	CP	Yes	Yes		
	SST.2013.2-2. New concepts for railway infrastructure and operation: adaptable, automated, resilient and high-capacity	CP	Yes	Yes	Yes	
	SST.2013.3-1. Managing integrated multimodal urban transport network	CP	Yes	Yes	Yes	Yes
	SST.2013.3-2. Implementing innovative and green urban transport solutions in Europe and beyond	CSA-CA			Yes	
	SST.2013.3-3. Capitalising CIVITAS knowledge and experience	CSA-CA			Yes	Yes
	SST.2013.4-1. Ships in operation	CP	Yes	Yes		
	SST.2013.4-3. Biomechanics and advanced digital human body models and testing for vehicle safety	CP-FP	Yes	Yes	Yes	

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Competitiveness and growth through innovation	AAT.2013.4-1. Systems and equipment.	CP-FP				Yes
	AAT.2013.4-2. Design systems and tools	CP-FP	Yes	Yes		Yes
	AAT.2013.4-3. Production	CP-FP	Yes			
	AAT.2013.4-4. Maintenance, repair and disposal	CP-FP	Yes	Yes		
	AAT.2013.4-5. Integrated environment for optimised airline maintenance and operations	CP-IP	Yes	Yes	Yes	Yes
	AAT.2013.4-6. Integrated thermal analysis and design for aircraft	CP-IP	Yes		Yes	
	AAT.2013.4-7. Large scale demonstration of extended Distributed Modular Electronics	CP-IP	Yes	Yes	Yes	
	AAT.2013.4-8. Seamless aeronautical networking through integration of data links, radios and antennas extended beyond ATM	CP-IP	Yes	Yes		
	SST.2013.5-1. Technical requirements for the certification of new materials for railway rolling stock	CP-FP		Yes		
	SST.2013.5-2. Low cost flexible automation and mechanisation in small to medium shipyards	CP-FP	Yes		Yes	Yes
	SST.2013.5-3. Innovative, cost-effective construction and maintenance for safer, greener and climate resilient roads	CP-FP	Yes	Yes	Yes	
Cross-cutting issues	AAT.2013.7-1. Coordinating research and innovation in the field of Aeronautics and Air Transport	CSA-CA			Yes	Yes
	AAT.2013.7-2. Coordinating research and innovation in the field of sustainable alternative fuels for Aviation			Yes		Yes
	AAT.2013.7-3. Communication of EU funded RTD project results to targeted audience	CSA-SA				Yes
	AAT.2013.7-4. Creating cohesive links and common knowledge between potential partners in EU Framework Programme Collaborative Projects	CSA-SA				Yes

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AAT.2013.7-5. Conference: support for the organisation of Aerodays	CSA-SA				Yes
AAT.2013.7-6. Enhancing coordination and stimulating cooperation in research and innovation among EU Member States and Associated States to the EU Framework Programme	CSA-SA				Yes
AAT.2013.8-1. Coordinated call with Russia	CP-FP	Yes			
AAT.2013.8-2. International cooperation on civil high speed air transport research	CP-FP	Yes		Yes	
SST.2013.6-1. Strengthening the research and innovation strategies of the transport industries in Europe	CSA-SA			Yes	Yes
SST.2013.6-2. Towards a competitive and resource efficient port transport system	CP CSA-CA			Yes	Yes
SST.2013.6-3. Organisation of Transport Research Awards for the Transport Research Arena (TRA) conference	CSA-SA				Yes
TPT.2013-1. Technology transfer in the area of Transport	CP-FP			Yes	Yes
TPT.2013-2. Mapping regional capacities in transport research and innovation	CSA-SA				Yes

(1) Funding schemes:

CP: collaborative project

CP-IP: collaborative project (large scale integrating project)

CP-FP: collaborative project (small or medium-scale focused research project)

CSA-CA: coordination and support action aiming at coordinating research activities

CSA-SA: coordination and support action aiming at supporting research activities

(2) Demonstration may include aspects such as prototyping, testing, demonstration and validation.

(3) Deployment and market take-up of innovative solutions may include preparing deployment strategies and roadmaps, cost-benefit analysis, benchmarking, transferring know-how, public/pre-commercial procurement, as well as identifying funding/finance opportunities, new niche markets, barriers and bottlenecks, and business models.

(4) Other innovation-related aspects such as mobilising all innovation actors (particularly SMEs), disseminating results, human skills requirements and training programmes.

Socio-economic research and cross-cutting issues

Policy-driven and socio-economic research actions are included in this work programme. They cross-cut the three Socio-economic Challenges and focus in helping the implementation of Transport and Innovation policies (White Paper and Innovation Union), and in strengthening, coordinating, evaluating and communicating research and innovation. These

actions are described in chapter 7.3 (Horizontal Activities) and in the cross-cutting sections of chapters 7.1 (AAT) and 7.2 (SST). They are included in the AAT and SST main calls (see lists of topics of cross-cutting and horizontal activities in sections III.1.1 and III.2.1).

Joint undertakings: ‘Clean Sky’, SESAR and FCH

On the basis of Article 187¹³ of the Treaty on the Functioning of the European Union (TFEU), the ‘Clean Sky’ Joint Technology Initiative¹⁴, the SESAR Joint Undertaking¹⁵, and the ‘Fuel Cells and Hydrogen’ Joint Technology Initiative¹⁶ will all be relevant to and will impact on transport innovation. These activities aim at final demonstration in appropriate operational environments. They will be implemented by separate mechanisms and the details of topics will not be elaborated in this work programme.

Bridging towards Horizon 2020

A major objective of this work programme is to pave the way for Horizon 2020. The three major priorities and socio-economic challenges presented above are in line with the activities proposed for the Transport challenge of Horizon 2020. Further emphasis is made on creating critical mass on areas of high innovation potential and EU-added value. As a consequence, there is more strategic prioritisation and selection of topics than in previous work programmes, more focus on larger projects, and the number of topics is reduced to about half compared to WP 2012. Particular care is taken on balancing all the components of the innovation cycle as explained above, and on anticipating some research areas and topics which in Horizon 2020 are proposed to have much higher relevance than in FP7 (e.g. rail and road infrastructures, ports and terminals, new logistic concepts, and urban networks).

b) SME relevant research

Participation of SMEs has strongly been encouraged in FP7 Transport Theme. A strategy planned for the whole period of FP7 (including support actions) has permitted the Transport theme to attain and even go beyond the 15% objective (participation: 20.9%; EU contribution: 17.3%; projects with SME participation: 88%; projects coordinated by SME: 14.8%)¹⁷. Specific actions targeted to support these objectives were included in all previous work programmes. The aim of this strategy is to encourage participation of SMEs in the Transport programme with the objective of enhancing their role in the supply chain. Actions are aimed at providing ad hoc support and training for partners and coordinators who want to set-up proposals, as well as access to relevant information. Emphasis has also been placed on facilitating the start-up and emergence of new high-tech SMEs. A better understanding of barriers and drivers in the Transport research area and specific support to the involvement of weaker players including SMEs is being pursued.

¹³ Ex Article 171 TEC.

¹⁴ Council Regulation (EC) No 71/2007 of 20 December 2007 setting up the Clean Sky Joint Undertaking (OJ L 30 of 4.2.2008) as amended by Commission Decision 2009/520/EC (OJ L 175 of 4.7.2009).

¹⁵ Council Regulation 219/2007 of 27 February 2007 as amended by Council Regulation 1361/2008 of 16.12.2008.

¹⁶ Council Regulation (EC) No 521/2008 of 30 May 2008 setting up the Fuel Cells and Hydrogen Joint Undertaking (OJ L 153 of 12.6.2008).

¹⁷ Data at 1 January 2012, ‘Eighth Progress Report on SMEs’ participation in FP7’, DG Research and Innovation.

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In line with the above-mentioned strategy, in WP 2013 several actions are included to fostering the role of SMEs in research and innovation as one of the objectives, and/or to satisfying their needs:

TPT.2013-1. Technology transfer in the area of Transport	CP-FP
TPT.2013-2. Mapping regional capacities in transport research and innovation	CSA-SA
SST.2013.1-3. ERA-NET Plus ‘Advanced systems, materials and techniques for next generation infrastructure’	CSA-CA
SST.2013.5-2. Low cost flexible automation and mechanisation in small to medium shipyards	CP-FP
GC.SST.2013-7. Technical and operational connectivity in intermodal freight transport	CP-FP

In addition to that, the participation of SMEs is important and explicitly recommended in the following topics:

AAT.2013.4-1. Systems and equipment.	CP-FP
AAT.2013.4-2. Design systems and tools	CP-FP
SST.2013.1-2. Towards the zero emission ship	CP
GC.SST.2013-1. Feasibility analysis and technological development of on-road charging for long term electric vehicle range extension	CP
OCEAN 2013.1. Biosensors for real time monitoring of biohazard and man-made chemical contaminants in the marine environment	CP
OCEAN 2013.2. Innovative multifunctional sensors for in-situ monitoring of marine environment and related maritime activities	CP
OCEAN 2013.3. Innovative antifouling materials for maritime applications	CP
OCEAN 2013.4. Innovative transport and deployment systems for the offshore wind energy sector	CP

c) Strengthening the European Research Area

In addition to the ERA structuring effects that are implicit in most of the activities and topics proposed in this work programme, the Transport theme continues supporting ERA-NET activities¹⁸ that develop trans-national coordination. In particular, an ERA-NET Plus is included in WP 2013, which is part of a joint call FP7-ERANET-2013-RTD that will be launched separately:

SST.2013.1-3. ERA-NET Plus ‘Advanced systems, materials and techniques for next generation infrastructure’	CSA-CA
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This action will increase effective national public investment and will be jointly implemented by MS/AS thus reinforcing pan-European research and innovation in this domain.

¹⁸ ERA-NET activities will be subject to a joint call across the Specific programme 'Cooperation' – See Annex 4.

Further, a number of topics are particularly suited for strengthening the ERA by e.g. helping transferring technology, creating links between potential partners or supporting European infrastructures and urban networks:

TPT.2013-1. Technology transfer in the area of Transport	CP-FP
TPT.2013-2. Mapping regional capacities in transport research and innovation	CSA-SA
AAT.2013.7-4. Creating cohesive links and common knowledge between potential partners in EU Framework Programme Collaborative Projects	CSA-SA
AAT.2013.7-6. Enhancing coordination and stimulating cooperation in research and innovation among EU Member States and Associated States to the EU Framework Programme	CSA-SA
SST.2013.2-2. New concepts for railway infrastructure and operation: adaptable, automated, resilient and high-capacity	CP
SST.2013.3-1. Managing integrated multimodal urban transport network	CP
SST.2013.3-3. Capitalising CIVITAS knowledge and experience	CSA-CA
SST.2013.5-3. Innovative, cost-effective construction and maintenance for safer, greener and climate resilient roads	CP-FP

d) Dissemination and exploitation actions

Building a European transport system that serves the citizen and society by means of safe, secure, greener, quality transport options for the demands of life in the 21st century requires significant RTD investment. In line with the innovation approach presented above, the creation of partnerships is of paramount importance to ensuring the dissemination and exploitation of results of this investment to promote growth and job creation. From research and technology development to market, all actors should be present in the project partnerships accordingly with their role, particularly in downstream research. Further, actions are included in chapter 7.3 (Horizontal Activities) and in the cross-cutting activities of AAT (chapter 7.1) and SST (chapter 7.2) to help bringing innovative products and services to the market (e.g. by coordinating research and innovation, creating cohesive links and common knowledge at industrial level, or transferring technology in the area of Transport). In many topics (e.g. AAT integrated projects) bottlenecks to innovation will be identified and possible solutions proposed.

Risk Sharing Finance Facility

In addition to direct financial support to participants in RTD actions, the European Union is improving their access to private sector finance by contributing financially to the 'Risk-Sharing Finance Facility' (RSFF) established by the European Investment Bank (EIB) (See Annex 4).

e) Overall expected impact

Many positive impacts on innovation and growth-enhancing benefits in all transport modes (air, road, rail and waterborne) are expected as a consequence of implementing WP 2013. They are detailed in the Activities or Topics. Overall they can be summarised as follows:

- Reduction of greenhouse gases (GHG) emissions (particularly CO₂) and pollutants, by e.g. focusing on developing aerodynamics and engines of aircraft, electric vehicles and infrastructures, and optimising energy systems in ships.
- Increased safety in transport, by e.g. taking into account human factors related to aircraft and operations, enhancing ship safety, and advanced tools and test methods for road vehicle safety.
- Easy mobility of passenger and goods, by e.g. technical and operational connectivity in intermodal freight transport, and managing integrated multimodal urban transport networks.
- Higher competitiveness of the European transport industry, by e.g. an integrated environment for optimised airline maintenance and operation, flexible automation and mechanisation in shipyards, and innovative, cost effective construction and maintenance of roads, and by actions helping to bring innovative products and services to the market.
- Among other funding schemes, large scale projects integrating demonstration, standardisation and certification will help promoting innovation in these issues (see table above).

I.0.3. International cooperation

International cooperation activities will be encouraged in the Transport theme based on the following lines of activities: 1) market attraction (e.g. global trade development and connecting networks and services at continental and intercontinental level); 2) opportunities to access and acquire science and technology that is complementary to current European knowledge and of mutual benefit; and 3) where Europe responds to global needs (e.g. climate change), contributes to international standards and global systems (e.g. applied logistics) or addresses third countries' regional issues on the basis of mutual interest and benefit. All activities are open to researchers and research institutions from third countries¹⁹. In some areas of mutual interest, enhanced participation of certain third countries is emphasised where relevant expertise, opportunities and common challenges are identified.

This approach has resulted in successful specific cooperation actions with Canada, China, Latin America, India, Japan, Russia, South Africa, Ukraine and United States in the period 2007-2012. Of particular relevance have been the coordinated calls with China and Russia in 2010 and with Japan in 2012. Based on this experience, a new coordinated call with Russia is included in WP 2013. Also cooperation with specific regions or countries is encouraged as indicated in the following list.

List of areas and topics for specific cooperation actions

Topics	Targeted country/region
AAT.2013.2-1. Airports	USA

¹⁹ Both International Co-operation Partner Countries (ICPC) and non-ICPC countries can participate. Organisations from EU Member States, from Associated States to FP7 and from ICPC can be funded in all cases, while from other countries only if indispensable (Cf. FP7 Rules for Participation). The list of eligible ICPC countries is provided in Annex 1.

AAT.2013.3-1. Human factors	ICPC and/or other third countries (e.g. Canada, USA)
AAT.2013.4-2. Design systems and tools	USA
AAT.2013.7-2. Coordinating research and innovation in the field of sustainable alternative fuels for Aviation	ICPC and/or other third countries (notably USA, Brazil)
AAT.2013.7-7. Exploring opportunities and stimulating cooperation in research and innovation with China	China
AAT.2013.8-1. Coordinated call with Russia	Russia
AAT.2013.8-2. International cooperation on civil high speed air transport research	Australia, Japan, Russia and possibly other third countries
SST.2013.1-3. ERA-NET Plus 'Advanced systems, materials and techniques for next generation infrastructure'	USA
SST.2013.3-2. Implementing innovative and green urban transport solutions in Europe and beyond	China, Singapore, Latin American countries, Mediterranean countries
SST.2013.4-3. Biomechanics and advanced digital human body models and testing for vehicle safety	ICPC and/or other third countries (e.g. USA, Japan)
SST.2013.5-3. Innovative, cost-effective construction and maintenance for safer, greener and climate resilient roads	USA
SST.2013.6-2. Towards a competitive and resource efficient port transport system	Mediterranean countries
GC.SST.2013-7. Technical and operational connectivity in intermodal freight transport	Mediterranean countries

I.0.4. Cross-thematic approaches

The European Green Cars Initiative. This initiative is part of the 'European Economic Recovery Plan', as explained in section I.0.1, and was launched in WP 2010. It is being jointly implemented by Energy, Environment, ICT, NMP and Transport. In WP 2013, it focuses on efficient, safe and convenient solutions for grid and road integration of electric vehicles. The grid connection system of fully electric vehicles is turning into a distinguishing factor between vehicle manufacturers, thus a jointly harmonised and standardised solution would be a competitive edge for Europe. The complete work programme text is presented in Annex 5.

The Ocean of Tomorrow. Special attention will be paid to cross-cutting marine and maritime research with the launch of a new cross-thematic call "The Ocean of Tomorrow": joining research forces to meet challenges in ocean management". It will be implemented jointly between Theme 2 "Food, Agriculture and Fisheries, and Biotechnology" (FAFB), Theme 4 "Nanosciences, Nanotechnologies, Materials and new Production Technologies" (NMP); Theme 5 "Energy", Theme 6 "Environment (including climate change)" and Theme 7 "Transport (including Aeronautics)". The main objective of the call is to promote research and innovation on marine technologies, in particular sensors, anti-biofouling materials, and innovative transport and deployment systems for the offshore energy sector. The topics and funding mechanisms will allow for large, multidisciplinary and multi-stakeholder topics with an appropriate balance between (basic/applied) research, knowledge transfer and

demonstration, and to support a number of specific EU policies. The four topics are published in the Work Programmes of all participating Themes, as a cross-thematic call. "The Ocean of Tomorrow" call (FP7-OCEAN-2013) is subject to a separate call fiche.

I.0.5. Societal aspects

Where relevant, account should be taken of possible socio-economic impacts of research, including its intended and unintended consequences and the inherent risks and opportunities. A sound understanding of this issue should be demonstrated both at the level of research design and research management. In this context, where appropriate, the projects should ensure engagement of relevant stakeholders (e.g., user groups, civil society organisations, policy-makers) as well as cultivate a multi-disciplinary approach (including, where relevant researchers from social sciences and humanities) and contribute to raising awareness, education and training. Projects raising ethical or security concerns are also encouraged to pay attention to wider public outreach.

The pursuit of scientific knowledge and its technical application towards society requires the talent, perspectives and insight that can only be assured by increasing diversity in the research workforce. Therefore, all projects are encouraged to have a balanced participation of women and men in their research activities and to raise awareness on combating gender prejudices and stereotypes. When human beings are involved as users, gender differences may exist. These will be addressed as an integral part of the research to ensure the highest level of scientific quality. In addition, specific actions to promote gender equality in research can be financed as part of the proposal, as specified in Appendix 7 of the Negotiation Guidance Notes²⁰.

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http://ec.europa.eu/research/participants/portal/ShowDoc/Extensions+Repository/General+Documentation/Guidance+documents+for+FP7/Negotiations+and+amendments/negotiation_en.pdf

7.1. AERONAUTICS AND AIR TRANSPORT

I.1. CONTEXT

This introduction is complementary to the general one (section I.0). The strategy for 2013 is summarised there, including the new innovation dimension of the activities, SME relevant research, international cooperation, and cross-thematic approaches and societal aspects. Only the specificities of the sub-theme are presented here.

The information provided in this introduction as well as in the content of calls for 2013 shall not be considered as eligibility criteria (unless it is explicitly indicated) but shall be taken into account during the evaluation for the respective evaluation criteria. For eligibility criteria and additional information, e.g. funding schemes, budget limits, etc., please refer to section III.

I.1.1. Specific approach for Aeronautics and Air Transport

The scope of research and innovation includes the technologies, services and operations of all the components of the air transport system (i.e. aircraft, airport and air traffic management) from airport kerbside to airport kerbside. Research regarding door-to-door aspects of the travel can also be included provided it focuses exclusively on aspects relevant to air transport and excludes ground vehicles.

The three **Socio-economic Challenges** indicated in section I.0.2 are addressed by six **Activities**, where proposers can find the **topics** calling for **proposals**. The Activities are in agreement with the Specific Programme and the Strategic Research Agenda of ACARE²¹:

1. The greening of air transport
2. Increasing time efficiency
3. Ensuring customer satisfaction and safety
4. Improving cost efficiency
5. Protection of aircraft and passengers
6. Pioneering the air transport of the future

In order to reflect the level of readiness of the developed technologies with respect to the final application that is commonly used in aeronautics, three Levels are applicable.

Level 0 is located at the origin of the technology readiness levels. It comprises the research and development of breakthrough, highly innovative technologies and concepts that need a first maturation before they can be developed at larger scale, within larger consortia and larger financial resources (for example in Level 1). In order to provide more agility and flexibility to the process, this is being implemented by means of a specific *open call*. The call fiche specifies recommendations for a limited size of the partnership, a shorter duration and lower budget compared to current practice in Level 1. The call covers exclusively promising pioneering ideas in air transport, i.e. technologies and concepts that have the potential to bring step changes to European aeronautics and air transport *in the second half of this century and*

²¹ ACARE: Advisory Council for Aeronautics Research in Europe (www.acare4europe.org).

beyond. Information on the eligibility criteria and evaluation procedure are detailed in the corresponding call fiche (section III.1.2) and in the Guide for Applicants.

Level 1 comprises the research and technology development activities that span from basic research to the validation of concepts at component or sub-system level in the appropriate environment through analytical and/or experimental means. *Generally, topics for Level 1 can be addressed in the proposals with a high degree of flexibility, selecting only part of a topic and/or combining several topics. However, in the frame of ‘coordinated calls’ (see below), topics must be answered in their entirety and a proposal should address only one topic.*

For most of the Level 1 topics, the requested EU contribution *shall not exceed EUR 5 million per topic* which threshold constitutes an additional eligibility criterion. Specific limits apply for the coordinated call with Russia and the coordinated call on High Speed Aircraft (sections III.1.3 and III.1.4).

Level 2 comprises the research and technology development activities up to higher technology-readiness, centred on the multidisciplinary integration and validation of technologies and operations through demonstration at a system level in the appropriate environment (large scale flight and/or ground test beds and/or simulators). Level 2 projects have also a particular role to play in the innovation process, i.e. they should identify potential bottlenecks that could prevent the effective use of the results for their application in product and services, including certification aspects where relevant. *Proposals can address only one of the proposed topics and should address it in its entirety.*

Only one proposal will be funded for each Level 2 topic (see section III.1.1, CP-IP). The requested EU contribution *shall exceed EUR 5 million and it is expected not to exceed EUR 35 million*. The minimum threshold (EUR 5 million) constitutes an additional eligibility criterion.

Level 3 comprises the research and technology development activities up to the highest precompetitive technology readiness, focusing on the combination of systems and the final demonstration in the appropriate operational environment of the comprised technologies in fully integrated system of systems. These activities will be undertaken in large scale public-private partnerships especially established for this purpose in specific areas: the ‘Clean Sky’ Joint Technology Initiative relevant mainly to the Work Programme Activity ‘The greening of air transport’ and SESAR, Single European Sky Air Traffic Management Research. Clean Sky and SESAR will also cover research activities of lower technology readiness levels (i.e. Level 1 and Level 2), where appropriate. Both Clean Sky and SESAR Joint Undertakings are briefly described in a subsequent section.

Cross-cutting activities. In addition to the above six activities, cross-cutting issues for *structuring European aeronautics research, supporting programme implementation and international cooperation* are addressed by means of Coordination and Support Actions. The requested EU contribution for *Coordination Actions shall not exceed EUR 1 200 000*, and for *Support Actions shall not exceed EUR 600 000*, which constitutes an additional eligibility criterion (see section III.1.1).

Topic description and expected impact. Previous work programmes were structured in Activities and Areas, where Areas were broadly dividing an Activity between Topics related to aeronautics/vehicle and Topics related to air transport operations. The ‘expected impact’

was described for each Area, and Topics with the same name were repeated in the relevant Areas detailing the elements specific to the Area under consideration. In the view of streamlining the approach, Areas are not explicit anymore in the structure, **the expected impact is now described at Activity level, if not defined under the individual topic**, and the former Areas are indicated in *italic*. Where relevant, a specific expected impact section is also added in the description of the Topic, which complements the general one(s). This is systematically the case for Level 2 projects.

Topics appear now only once under the Activity that is the most relevant, but they can still contain elements that are relevant to other Activities. This is indicated in the Topic description as follows: Activity 1: *Greening/environmental*; Activity 2: *Time efficiency*; Activity 3: *Customer satisfaction / Safety*; and Activity 4: *Cost efficiency*.

I.1.2. Coordinated call with Russia

Following workshops held between European and Russian stakeholders in the field of Aeronautics and Air Transport, a coordinated call with Russia is included in WP 2013 with an indicative EU budget of EUR 4.5 million and a matching amount from Russia (see section III.1.3). The European partners will be funded by the European Union. The Russian partners will be funded by the Department of Aviation Industry (Ministry for Industry and Trade of the Russian Federation) and other authorities concerned. The requested EU contribution *shall not exceed EUR 1.2 million per project*, which is an additional eligibility criterion. In order to ensure a balance between EU and Russian participants, *at least two independent legal entities established in Russia are requested*, which is another additional eligibility criterion.

I.1.3. Coordinated call on high speed air transport research

Following a number of Level 1 projects on environmentally and economically sustainable high speed aircraft (e.g. ATLLAS I-II, LAPCAT I-II), a workshop held between European and Australian, Japanese and Russian stakeholders on this subject demonstrated the scientific interest to coordinate efforts in the view of performing flight-tests. Therefore, a Topic is opened in the frame of a specific coordinated call where the EU dedicates an indicative EU budget of up to EUR 5 million to fund European partners. However, a certain number of conditions apply as described in the call fiche (see section III.1.4). The EU contribution requested by a project *shall not exceed EUR 5.0 million*, which is an eligibility criterion. *Only one project is expected to be funded*. Furthermore, a proposal submitted to the European Commission (EC) will be eligible only if it is coordinated **with at least two** complementary proposals either submitted in parallel or to be submitted afterwards to the corresponding funding authorities/organisations of Australia, Japan or the Russian Federation **or with at least two** complementary projects already selected for funding from these Third Countries to be synchronised in time with the EU project.

I.1.4. 'Clean Sky' Joint Technology Initiative

The 'Clean Sky' (CS) Joint Technology Initiative is a unique public private partnership aiming at developing environmentally friendly technologies impacting all flying segments of commercial aviation, thus contributing to the ACARE targets for reduction of emissions and noise in Air Transport in Europe and increasing the competitiveness of the European aeronautical industry.

To implement CS, the European Union, represented by the Commission, and the major aeronautical stakeholders in Europe have set up a Joint Undertaking (CS JU) as a legal entity for a period up to 2017. The Council Regulation setting up the CS JU was adopted in December 2007. Since autumn 2009, the Joint Undertaking is autonomous from the Commission.

The objectives of the CS JU are to be achieved through the support of research activities that pool resources from the public and private sectors, and that are carried out by the main aeronautical stakeholders (CS private members) directly and by partners selected following open and competitive calls for proposals. The total budget of CS amounts to up to EUR 1.6 billion.

Clean Sky is organised in six Integrated Technology Demonstrators, corresponding to technological research areas, each led by two founding members:

Smart Fixed Wing Aircraft (SFWA) led by Airbus and Saab
Green Regional Aircraft (GRA) led by Alenia Aeronautica and EADS Casa
Green Rotorcraft (GRC) led by Agusta-Westland and Eurocopter
Sustainable and Green Engines (SAGE) led by Rolls-Royce and Safran
Systems for Green Operations (SGO) led by Thales Avionics and Liebherr Aerospace
Eco-design (ED) led by Dassault Aviation and Fraunhofer Gesellschaft

A Technology Evaluator (TE) led by Thales Avionics and DLR has the purpose of assessing the environmental performance of the technologies developed in CS.

At least 25% of the EU funding to the CS JU is allocated to partners selected via calls for proposals. They serve the dual purpose of widening the participation to Clean Sky to further organisations, especially SMEs, and to identify R&D performers called in to participate to the mainstream activities of Clean Sky.

The activities related to Clean Sky are implemented by separate mechanisms and the details of topics will not be elaborated in this work programme, as Clean Sky is autonomous in the execution of its budget. Call for proposals are published on www.cleansky.eu as well as on the Participant Portal²².

I.1.5. SESAR – Single European Sky Air Traffic Management (ATM) Research

The SESAR (Single European Sky ATM Research) Programme has been launched as an integrated part, the “technological pillar”, of the Single European Sky initiative (SES). It aims at developing a modernised and high-performance air traffic management infrastructure which will enable the safe, cost-efficient and environmentally friendly development of air transport in support of the Single Sky 2020 objectives.

The on-going SESAR Development phase (2008-2016) is managed by the SESAR Joint Undertaking (SJU), established by a Council Regulation, under Article 187 of the TFEU. This includes the targeted and coordinated research, development and validation activities of the SESAR programme, and SJU is responsible for the execution and maintenance of the

²² <http://ec.europa.eu/research/participants/portal/>

European ATM Master Plan. In order to rationalise and organise ATM research so that it leads to actual operational and industrial implementation, all relevant Air Traffic Management (ATM) research in the Seventh Framework Programme will be undertaken and implemented by the SJU. It will also be coordinated with other aeronautical research activities in order to maintain a consistent system wide approach for the entire air transport system and in order to avoid possible duplications between different programmes.

The SESAR development phase programme is composed of over 300 research projects and transversal activities, plus other supporting activities defined in the multi-annual and annual work programme and in the General Agreement with the Commission. As the SJU is subject to its own separate mechanisms, the details will not be developed in this Work Programme for 2013. The detailed description of the work programme can be obtained via the SJU webpage www.sesarju.eu.

The European Union will provide a maximum total contribution of EUR 700 million to the SJU for the development phase of the programme over the period 2007-2013. This amount will be provided in equal parts from the Seventh Framework Programme for research and technological development and from the Trans-European Network programme. The contribution of EUR 350 million from FP7 shall be transferred to the SJU by the Commission through annual contributions over the entire programme in accordance with a General Agreement concluded between them. This contribution shall be used to finance the costs of the activities in the relevant areas indicated in the work programme, including programme management, and the running costs of the SJU. For this purpose, an amount of EUR 60.01 million will have to be transferred to the SJU for the year 2013.

II.1. CONTENT OF CALLS FOR 2013

CHALLENGE 1. ECO-INNOVATION

<p>The decarbonisation of the transport system and an efficient use of natural resources, i.e. eco-innovation in all transport modes and the continuation of the development of clean vehicles and vessels.</p>

Activity 7.1.1. The greening of air transport

Developing technologies to reduce the environmental impact of aviation with the aim to halve the emitted carbon dioxide (CO₂), cut specific emissions of nitrogen oxides (NO_x) by 80% and halve the perceived noise. Research will focus on furthering green engine technologies including alternative fuels technology as well as improved vehicle efficiency of fixed-wing and rotary wing aircraft (including helicopters and tiltrotors), new intelligent low-weight structures, and improved aerodynamics. Issues such as improved aircraft operations at the airport (airside and landside) and air traffic management, manufacturing, maintenance and recycling processes will be included.²³

Expected impact: The aim is to ensure more environmentally friendly air transport focussing on the following *Areas*:

- *Green aircraft* – addressing the greening and energy optimisation of aircraft, without compromising safety.
- *Green air transport operations* – addressing the greening and energy optimisation of aircraft and airport operations, as well as to provide tools for improved understanding of the environmental role of aviation in support of European policy-making.

Proposals targeting these two areas should demonstrate making significant contributions to achieving one or several of the following objectives for technology readiness by 2020 taking 2001 as the baseline:

- To reduce fuel consumption and hence CO₂ emissions by 50% per passenger-kilometre.
 - To reduce NO_x emissions by 80% in landing and take-off according to ICAO²⁴ standards and down to 5 g/kg of fuel burnt in cruise.
 - To reduce unburned hydrocarbons and CO emissions by 50% according to ICAO standards.
 - To reduce external noise by 10 EPNdB per operation of fixed-wing aircraft. For rotorcraft the objective is to reduce noise foot-print area by 50% and external noise by 10 EPNdB.
- *Ecological production and maintenance* – addressing the cleanliness of the industrial processes involved in the manufacturing and maintenance of aeronautical products to reduce toxic emissions as well as improve re-usability and disposal. Where appropriate the modification of maintenance rules should be considered. Proposals targeting this area should demonstrate making contributions to substantially reduce the environmental impact of the manufacturing, maintenance and disposal of aircraft and related products.

AAT.2013.1-1. Flight physics

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on flight physics will focus on the *greening* of air transport while taking into account the *cost efficiency* related aspects. Proposals could address the following subjects:

²³ The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

²⁴ International Civil Aviation Organization.

- Advanced or novel aircraft configuration concepts, including improved airframe/engine integration, which could deliver enhanced aerodynamic efficiency compared to traditional configurations for subsonic, transonic or supersonic flight.
- Advanced concepts and technologies for airframe aerodynamics design to reduce drag.
- Advanced designs for high lift over drag ratios; innovative high lift devices to enable steeper take-off and landing flight profiles.
- Development of adaptive wing and wing morphing technologies.

Note: In WP 2013, active and passive flow control technologies for drag reduction are addressed by Topic AAT.2013.1-4.

AAT.2013.1-2. Aerostructures

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on aerostructures will focus on the *greening* of air transport while taking into account the *cost efficiency* and *safety* related aspects. Proposals could address advanced concepts and technologies for the following subjects:

Greening:

- Increased and optimised use of light-weight metallic, composite materials, including metal laminates, in primary structures; application of ‘smart’ materials, multi-functional materials, micro and nano-technologies; ‘smart’ structures and morphing airframes with a potential to reducing greenhouse gas emissions; and mastering aero-elasticity issues.

Cost efficiency:

- Development of highly integrated structures with optimum combination of advanced metallic and composite materials eliminating or minimising the number of join/assembly elements.
- Increased integration of additional functions (sensing, actuating, electromagnetic, electrical conductivity, etc.) in structural components for wider ‘greener’ applications at low cost and weight.

Safety:

- Experimental validation for improved protection against crash, impacts and blast loads, including passive and active ‘smart’ aerostructures, to ensure safety of aging airframe and engine structures.

AAT.2013.1-3. Low pressure system for Ultra High By-Pass Ratio Engine

Level 2 - CP-IP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research will target the maturation of a coherent and integrated set of technologies enabling the Low Pressure (LP) systems needed for the next generation of Ultra High By-Pass Ratio Engine operating with high overall pressure ratio (> 50). The research work will encompass comprehensively all the components of the LP system:

- Regarding the by-pass flow system (i.e. fan system, intermediate case, nacelle and exhaust system), work will focus on an integrated approach to preserve high levels of aerodynamic efficiency (in spite of a reduced fan pressure ratio), on minimising the weight thanks to an increased use of lightweight material and the introduction of novel structural concepts (in spite of an increased external diameter) and on minimising the noise; mounts, pylon and airframe integration aspects should be considered.
- Regarding the LP compressor and the LP turbine, both geared (high speed LP shaft) and ungeared (low speed LP shaft) configurations will be investigated for high levels of

aerodynamic efficiency and low weight; designs will target compressor operability, low noise turbine and high aerodynamic loads for the low shaft speed case.

- Regarding the transmission systems (for the geared approach), methodologies will be developed to improve the heat management of the gearbox and to better predict the transient dynamic behaviour and ensure safe operation under transient regimes.

The impact of the investigated technologies on fuel consumption, emission and noise and operability will be assessed quantitatively using an integrated technology evaluation methodology and in coherence with related projects such as LEMCOTEC or other related projects working on the high pressure system.

Bottlenecks to innovation that could prevent their implementation such as for example cost, weight, safety, certification requirements, market conditions, etc. will be identified.

Expected impact: It is expected that the project will deliver the ultra-high by-pass ratio LP system enabling future high overall pressure ratio engine, and allowing significant reductions in fuel consumption, emission and noise.

AAT.2013.1-4. Maturation of an integrated set of active flow, load and noise control technologies for the next generation of active wing, including in-flight demonstration

Level 2 - CP-IP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research will target the maturation of a coherent and integrated set of promising technologies for active flow, load and noise control. Work will focus on sensors, actuators, control systems and strategies which have a clear potential to reduce drag, to control loads and reduce noise. These are for example technologies to maintain hybrid laminar flow over the wing, to control local separation, to control the flow conditions on the trailing and side edges of the wing, to master transonic effects (wave drag and buffeting), to control potential excitation to the airframe (e.g. jet airframe interaction). Research will also include innovative wing layouts, taking advantage of recent advances in materials and structural design and in combination with flow control technologies.

The concepts will be matured under representative conditions in wind tunnels up to Technology Readiness Levels 4-5 while the most mature technologies will be demonstrated with flight tests. The design of the experiments will make the best use of multi-disciplinary design environments and exploit the potential multifunctional use of the technologies (i.e. to reduce drag and/or control noise and/or control loads).

The project will perform an integrated and coherent quantitative assessment of the potential of the different technologies to reduce drag (fuel consumption), noise and improve load control. The assessment will include the identification of bottlenecks to innovation that could prevent their implementation, such as, for example, cost, weight, safety and certification requirements.

Expected impact: It is expected that the project will increase the technology readiness of active flow technologies, down-select a coherent and integrated set of technologies in the perspective of allowing a later a large scale demonstration.

CHALLENGE 2. SAFE AND SEAMLESS MOBILITY

The optimisation of the global efficiency and safety of the transport system (by application of Intelligent Transport Systems and logistics), making efficient use of infrastructure and network capacity, with the aim of offering safe and seamless transport and mobility to all European citizens, as transport is also crucial for social inclusion.

Activity 7.1.2. Increasing time efficiency

Realising a step-change in aviation in order to accommodate the projected growth of three times more aircraft movements by improving punctuality in all weather conditions and reducing significantly the time spent in travel-related procedures at airports while maintaining safety. Research will develop and implement an innovative Air Traffic Management (ATM) system within the context of the SESAR initiative, by integrating air, ground and space components, together with traffic flow management and more aircraft autonomy. Design aspects of aircraft to improve handling of passengers and cargo, novel solutions for efficient airport use and connecting air transport to the overall transport system will also be addressed. The most efficient coordination of the development of ATM systems in Europe will be ensured through the SESAR initiative²⁵.

Expected impact: The aim is to ensure reduced waste of time in air transport operations focussing on the improved time-efficiency of basic operational infrastructures, namely the airport and air traffic management. Research work will address a wide range of innovative concepts and methodologies which will result in optimised passenger-related activities. Proposals should demonstrate making contributions to achieving one or several of the following objectives for technology readiness by 2020:

- To enable the air transport system to accommodate three times more air movements.
- To enable 99% of flights to arrive and depart within 15 minutes of their scheduled departure time, in all weather conditions.
- To reduce the time spent by passengers in airports for purely transportation related procedures to under 15 minutes for short-haul flights and to under 30 minutes for long-haul.

AAT.2013.2-1. Airports

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on airports will focus on increasing *time efficiency* while taking into account the *environmental* related aspects. Proposals could address the following subjects:

Time efficiency:

- Advanced concepts and techniques for
 - time efficient passenger and luggage flow in the terminal area and for passenger boarding patterns, including multi-door embarking and disembarking;

²⁵ The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

- time efficient freight operations, including comprehensive planning of airport operations; and
- advanced fleet management concepts and techniques for fast, efficient and reliable turnaround at the apron area.
- Innovative modelling tools and techniques in support of:
 - strategic decision making for improved flexibility and optimum use of airports in the context of the full air transport system; and
 - integrated decision making allowing time optimised passenger choices.

Greening:

- Concepts and technologies for:
 - reducing greenhouse gas, pollutant and noise emissions for apron operations (e.g. boarding of passengers, support to aircraft at the gate, services provided by ground vehicle etc.); and
 - new environmentally friendly approach for aircraft de-icing, real time detection, monitoring and modelling of local air quality and aircraft noise around airports
- Investigations for improved understanding of the effects of aircraft noise in the airport surrounding community (cooperation with the USA is encouraged in this particular item).

Note: Proposals should focus on landside operations. Proposal involving airside operations must demonstrate that they complement but not duplicate activities foreseen in SESAR.

Activity 7.1.3. Ensuring customer satisfaction and safety

Introducing a quantum leap in passenger choice and schedule flexibility, whilst achieving a five-fold reduction in accident rate. New technologies will enable a wider choice of aircraft/engine configurations ranging from wide body to smaller size vehicles including rotorcraft, increased levels of automation in all the elements of the system. Focus will also be on improvements for passengers comfort, wellbeing and new services, cabin logistics systems and active and passive safety measures with special emphasis on the human element. Research will include the adaptation of airport and air traffic operations to different types of vehicles and 24-hour utilisation at acceptable community noise levels²⁶.

Expected impact:

Concerning *passenger friendly air transport operations*, the aim is to ensure that the passenger is less exposed to delays and travel inconveniences due to air transport operations. Research work will address a wide range of innovative solutions and technologies which will contribute to improve passenger related activities at the airport and timely aircraft maintenance operations. Proposals should demonstrate making contributions to achieving one or several of the following objectives for technology readiness by 2020:

- To increase passenger services and choice.
- To enable 99% of flights to arrive and depart within 15 minutes of their scheduled departure time, in all weather conditions.

²⁶ The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

- To reduce the time spent by passengers in airports for purely transportation related procedures to under 15 minutes for short-haul flights and to under 30 minutes for long-haul.

Concerning *aircraft and operational safety*, the aim is to ensure that aviation safety remains at current high standards or even improves regardless of air transport growth, through the increased enhancement of the safety of the aircraft itself, its systems and air transport operations. Research work will address a wide range of concepts, innovative solutions and technologies for active and passive safety measures related to essential features of aircraft designs, human factors, operation of basic infrastructures of the system, such as airports and air traffic management, as well as to improved integrated safety solutions. Proposals should demonstrate making contributions to achieving one or several of the following objectives for technology readiness by 2020:

- To reduce accident rate by 80%
- To achieve a substantial improvement in the elimination of and recovery from human error.
- To mitigate the consequences of survivable accidents.

International cooperation is encouraged on topics related to safety (e.g. where standardisation issues are considered). In particular, cooperation with Canada and USA is encouraged on subjects related to safety in adverse atmospheric conditions and on human factor aspects.

AAT.2013.3-1. Human factors

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation will focus on *customer safety* (vehicle and operations) while taking into account the *cost efficiency* related aspects. Proposals could address the following subjects:

Safety:

- Advanced concepts, methods and techniques for:
 - improved human centred design of cockpit displays;
 - improved understanding of the human factor (e.g. state of mind, attention, awareness, response to the stress) in support of human-machine interaction and the role of automation in the decision-making process;
 - improved crew performance and collaboration in the cockpit when managing information from different ends such as cockpit, ATM and ground control;
 - increased consideration of human behaviour in the conceptual design of the air transport system, in particular with regard to the mission of the crew and maintenance personnel, with special consideration of abnormal situations and crisis management; and
 - training of crews.

Cost efficiency:

- Advanced concepts and techniques, including training, to support the acquisition and retention of skills and knowledge of personnel in the air transport system.

If ATM related aspects are addressed, close coordination with SESAR will be ensured and complementarity demonstrated.

CHALLENGE 3. COMPETITIVENESS THROUGH INNOVATION

The strengthening of the competitiveness of European transport industry through innovation, as competition from developed and emerging economies is intensifying in a global economy.

Activity 7.1.4. Improving cost efficiency

Fostering a competitive supply chain able to halve the time-to-market, and reduce product development and operational costs, resulting in more affordable transport for the citizen. Research will focus on improvements to the whole business process, from conceptual design to product development, manufacturing and in-service operations, including the integration of the supply chain. It will include improved simulation capabilities and automation, technologies and methods for the realisation of innovative and zero-maintenance, including repair and overhaul, aircraft, as well as lean aircraft, airport and air traffic management operations²⁷.

Expected impact:

Concerning *aircraft development costs*, the aim is to ensure cost efficiency in air transport focussing on the reduction of aircraft acquisition costs. Research work will address a wide range of concepts, innovative solutions and technologies which will result in lower lead time and costs of the aircraft and its systems from design to production, including certification, with a more competitive supply chain. Proposals should demonstrate making contributions to achieving one or several of the following objectives for technology readiness by 2020:

- To reduce aircraft development costs by 50%.
- To create a competitive supply chain able to halve time to market.
- To reduce travel charges.

Concerning *aircraft operational cost*, the aim is to ensure cost efficiency in air transport focussing on the reduction of aircraft direct operating costs. Research work will address a wide range of concepts, innovative solutions and technologies which will increase energy efficiency and reduce weight, fuel consumption, maintenance, and crew operational costs as main contributors. Proposals should demonstrate making contributions to achieving one or several of the following objectives for technology readiness by 2020:

- To reduce aircraft operating costs by 50% through reduction in fuel consumption, maintenance and other direct operating costs.
- To reduce travel charges.

Concerning *air transport system operational cost*, the aim is to ensure cost efficiency in air transport focussing on the reduction of the operational costs relevant to the system. Research work will address a wide range of innovative concepts and technologies which will increase cost efficiency in basic operational infrastructures such as airports and air traffic management, including also the human element. Proposals should demonstrate making contributions to achieving one or several of the following objectives for technology readiness by 2020:

²⁷ The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

- To reduce operating costs by 20%
- To reduce travel charges.

AAT.2013.4-1. Systems and equipment

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on systems and equipment will focus on improving *cost efficiency* while taking into account the *environmental* and *safety* related aspects. Proposals could address the following subjects:

Cost efficiency:

- simulation of installation environments to enable rapid customisation and industrialisation with low manufacturing and maintenance costs; and
- innovative management systems for small aircraft operators

Greening:

- Advanced concepts and technologies for:
 - the all-electric aircraft;
 - reducing engine bleed and systems weight, including power generation, distribution and management, primary flight control;
 - reducing weight of mechanical, pneumatic and hydraulic systems; and
 - aircraft anti-icing and de-icing.

Customer satisfaction and safety:

- New technologies, equipment and systems for:
 - detection of aircraft internal air contamination;
 - on-board detection, awareness and avoidance systems for weather hazards and/or volcanic ash;
 - enhanced levels of safety for small aircraft; and
 - alternative landing and take-off on/from unprepared terrain (including water).

The involvement of SMEs is strongly encouraged.

AAT.2013.4-2. Design systems and tools

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on design systems and tools will focus on improving *cost efficiency* of vehicles and operations while taking into account the *greening* and *safety* related aspects. Proposals could address the following subjects:

Cost efficiency (vehicle):

- Advanced modelling and simulation tools to include ‘virtual reality’ in support of design and ‘virtual prototyping’; development of advanced cost-effective highly accurate computational tools, including multidisciplinary optimisation, and experimental testing methods in the fields of structural analysis, fluid dynamics, aeroelasticity, flutter, noise, dynamic loads, flight dynamics, aerothermodynamics, icing thermodynamics, electromagnetic environment.
- Knowledge-based design tools and methods to include integrated life-cycle (design, manufacturing, maintenance, re-use or disposal) product definition.
- Concepts and methodologies for efficient multi-site product development in support of the extended enterprise.

- Methods and tools to support reconfigurable customisation of aircraft cabin architectures and interior designs; methods and tools enabling the modular aircraft concept; on-ground and in-flight tests; advanced concepts and procedures in support of novel approaches to certification of aeronautical products and operations.

Cost efficiency (operations):

- Innovative modelling tools and techniques in support of collaborative decision making for improved flexibility and optimum use of aircraft (fleet management).

Greening:

- Advanced simulation tools and systems:
 - to model interdependencies between air transport, environment and the society; and
 - to assess the potential of alternative fuels prior to production (including for certification purpose).

Safety:

- Advanced concepts and techniques for the development of safety metrics to identify, assess and manage the risks in systems and procedures taking into account reliability, resilience, maintainability and availability; development of anticipation, diagnostic and prognostic systems for early detection and response to faults, incidents and accidents; advanced concepts and procedures in support of novel approaches to certification of aeronautical products and operations; tools and procedures supporting a system approach to safety encompassing flight, air traffic and ground components and the evaluation of the system performance.

If ATM related aspects are addressed, close coordination with SESAR must be ensured and complementarity demonstrated. The involvement of SMEs is strongly encouraged. International cooperation with the USA is encouraged in the field of interdependencies modelling.

Note: Integrated thermal analysis and design for aircraft is the subject of Topic AAT.2013.4-6, thus design tools and systems related to this domain are excluded from the current Topic.

AAT.2013.4-3. Production

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on production processes and technologies will focus on improving *cost efficiency* while taking into account the *environmental* related aspects. Proposals could address the following subjects:

Cost efficiency:

- Development of advanced 'intelligent' knowledge-based manufacturing, assembly processes and technologies with increased degree of automation.
- Advanced manufacturing methods to reduce both recurring and non-recurring costs across the whole production cycle from single component manufacturing process to final assembly including techniques to repair and re-use key components and for reduction of waste and consumables.
- Development of techniques for increased flexible tooling.
- Advanced in-process inspection and quality control, including knowledge-based diagnosis and prognosis and damage tolerance.
- Tools and procedure to manage production workload and timing.

Greening:

- Advanced concepts and techniques for:

- the elimination of toxic chemicals and materials and reduction of waste in manufacturing processes; and
- increased utilisation of environmentally sustainable materials in aeronautical products in a safety neutral approach.

AAT.2013.4-4. Maintenance, repair and disposal

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on processes and technologies for maintenance, repair and disposal will focus on improving *cost efficiency* while taking into account the *environmental* and *safety* related aspects. Proposals could address the following subjects:

Cost efficiency:

- Advanced concepts and techniques for:
 - continuous inspection of structures and systems allowing on-time maintenance and eliminating unscheduled maintenance;
 - ‘smart’ on-condition maintenance systems, including self-inspection and self-repair capabilities up to ‘maintenance-free’ aircraft; and
 - cost-efficient repair and overhaul operations applicable at the gate or at the workshop including time and cost-efficient logistic processes for the supply of parts.

The relevant certification strategies should be developed in parallel with the research work.

Greening:

- Advanced concepts and techniques for:
 - elimination of toxic chemicals and materials and reduction of waste in maintenance operations;
 - increased re-use of components; and
 - increasing the life-time of aeronautical products and for full recyclability at life-end in a safety neutral approach.

Safety:

- Advanced concepts and techniques for:
 - continuous health and usage monitoring (e.g. non-destructive testing, signal processing techniques); and
 - avoidance/mitigation of structural corrosion.

AAT.2013.4-5. Integrated environment for optimised airline maintenance and operations

Level 2 - CP-IP - Call: FP7-AAT-2013-RTD-1

Content and scope: The work will target the development of a coherent set of technologies and systems to be implemented in a flexible multiple-user integrated framework for aircraft fleet maintenance and operations. Innovative technologies and concepts will encompass fleet management (e.g. real time operational awareness, operator centred decision making, etc.), management of the maintenance (e.g. optimised maintenance thanks to on-demand and/or event-based health status reporting, remote support, and just-in-time spares delivery), inclusion of maintenance aspects in the design process, use of ICT solutions and mobile devices for information transmission, finding and also allowing a flexible training of maintenance actors and pilots.

These technologies and concepts will be integrated in a flexible open environment (extended enterprise) allowing stakeholders to interact and allowing optimisation of operations, e.g. maximise availability and minimise usage of fuel while maintaining the highest level of safety. Demonstrations will be performed involving hardware and software prototypes to validate the effectiveness of the system and the benefits for the different stakeholders will be evaluated. Bottlenecks preventing innovation (e.g. implementation of this framework for the different stakeholders, data protection, handling of IPR, etc.) and associated potential solutions will be identified.

The consortium should involve the relevant stakeholders from airline, maintenance, aircraft, equipment, research, and certification/standardisation.

Expected impact: It is expected that the project will increase aircraft availability, reduce maintenance costs, set-up training methods making use of modern ICT tools and ensure awareness of abnormal operations within airlines. The project should deliver a first corner stone towards the extended enterprise for maintenance and operations.

AAT.2013.4-6. Integrated thermal analysis and design for aircraft

Level 2 - CP-IP - Call: FP7-AAT-2013-RTD-1

Content and scope: The research and development work will target the extension of the Behavioural Digital Aircraft (BDA) concept with enhanced models and capabilities, evolving towards multilevel and multidisciplinary design, in particular the design of the thermal environment of the aircraft. Research will develop innovative technologies and concepts to introduce:

- Super-integration combining physical and functional designs allowing the platform to have a capacity to act early in the architecture phase.
- New approach to aircraft definition allowing the management of different definition levels, maturity levels (e.g. design, technology, integration) and granularity levels (from component level to global architecture level) in an incremental, flexible and traceable approach.
- Dynamic interconnections between the different scientific disciplines (aerodynamics, structures, acoustics, etc.) allowing the aircraft definition to evolve in a more robust way thanks to earlier multidisciplinary analysis and optimisations.
- Particular focus on the thermal modelling design aspects to answer the challenges of composites fuselage and the more electric aircraft and to optimise the overall thermal energy management and needs.

The effectiveness of this enhanced BDA platform will be demonstrated on a thermal use case. Particular attention will be dedicated to identify and resolve where appropriate aspects that could prevent innovation such as collaborative management of the platform, interfaces the handling of partners IPR and security in a shared platform.

Expected impact: The work will aim at extending the collaborative multi-partner European aircraft design capacity to the architecture phase, to enhance the simultaneous handling of different levels, the multidisciplinary design and optimisation capacity, in particular for thermal modelling.

AAT.2013.4-7. Large scale demonstration of extended Distributed Modular Electronics

Level 2 - CP-IP - Call: FP7-AAT-2013-RTD-1

Content and scope: The research and development work will target the extension of the avionics related Distributed Modular Electronics (DME) concept to non-avionics related electronic equipment. The proposed project will aim at rationalising and standardising on-board databases and include servers interconnection. It includes, for example, open world communications, cabin electronics, wireless links, smart sensors, power distribution systems and remote cabinets thus extending the DME approach to all aircraft domain. The network will be designed to ease inclusion/removal of elements allowing fast and flexible upgrades and or extensions and make the best use of digital communications technologies.

The concept will be tested on a large scale demonstrator including state of the art hardware and commercial off the shelf electronics in an environment that is representative of the aircraft.

The consortium should gather the research community in the field together with suppliers (of systems, functions, equipment, IT, sensors, etc.) and aircraft manufacturers, and will be connected to airlines and certification authorities. The large scale demonstration will also aim at quantifying the benefits for all the suppliers and stakeholders involved. Barriers to innovation and associated potential solutions will be identified.

Expected impact: The work will aim at reducing significantly the needed volume and weight of electronics while enlarging the scope of applications for operations, maintenance and to answer passenger ICT needs.

AAT.2013.4-8. Seamless aeronautical networking through integration of data links, radios and antennas extended beyond ATM

Level 2 - CP-IP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation actions will target the extension of the seamless aeronautical networking concept to communication, navigation and surveillance applications. In the view of modularity, flexibility and cost efficiency (acquisition and maintenance), approaches should be based as much as possible on compatible sets of hardware and software and use commercial of the shelf components. These will be integrated in a flexible architecture allowing re-configurability for optimum use, implementation of redundancy and application on a wide number of aircraft types (e.g. commercial air transport, rotorcraft, regional aircraft and business jets). As the architecture evolves and matures, the project will envisage how to achieve the certification.

The robustness and effectiveness of developed architecture will be demonstrated on representative communication, navigation and surveillance (CNS) applications. The demonstration should assess quantitatively the gains obtained and prove the benefits of the approach to the actors involved.

Expected impact: It is expected that this extended reconfigurable architecture will not only cut significantly costs but also minimise weight, space usage and energy consumption.

Activity 7.1.5. Protection of aircraft and passengers

No topic is open in 2013.

Activity 7.1.6. Pioneering the air transport of the future

Exploring more radical, environmentally efficient, accessible and innovative technologies that might facilitate the step change required for air transport in the second half of this century and beyond. Research will address aspects such as new propulsion and lifting concepts, new ideas for the interior space of airborne vehicles including design, new airport concepts, new methods of aircraft guidance and control, alternative methods of air transport system operation and their integration with other transport modes²⁸.

Expected impact: Proposals should investigate breakthrough technologies and concepts that have the capacity to cause a step change in aeronautics and air transport in the second half of this century.

AAT.2012.6-1. Breakthrough and emerging technologies

Level 0 - CP-FP - Call: FP7-AAT-2012-RTD-L0

Content and scope: Investigation of emerging technologies or technologies from other sectors which have the potential to bring radical new approaches to the vehicles, the propulsion technology, the energy needed for the flight, the tools to provide guidance and control to the vehicles, the ground infrastructures for passengers and freights and the impact of the air transport on the environment. The research work will make the best use leading-edge facilities and/or simulation tools. At the end of the project, the progress against the technology readiness scale will be evaluated, the potential of the technologies to be developed at further technology readiness level will be assessed and barriers that could prevent such development identified.

AAT.2012.6-2. Radical new concepts for air transport

Level 0 - CP-FP - Call: FP7-AAT-2012-RTD-L0

Content and scope: Investigation of radical new concepts for the air transport system. The research work will propose and assess new approaches to systems for the air transport such as new approaches to the control and guidance of vehicles, the way passengers or freight access the vehicle, the way air transport is connected with other modes and the way travel information is handled. The functioning of the concept should be technically proven. The performance will be assessed preferably quantitatively against the relevant criteria such as for example economic viability, time efficiency, safety, environmental friendliness, energy sustainability, etc. Qualitative assessment will be done for non-quantifiable criteria such as for example potential to cope with evolutions of current regulations, passenger friendliness, social acceptance etc. The investigation will also address the evolution from / compatibility with today's transport system.

²⁸ The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

CROSS-CUTTING ACTIVITIES FOR IMPLEMENTING THE SUB-THEME PROGRAMME

Cross-cutting activities in the Aeronautics and Air Transport Work Programme 2013 support the achievement of actions which help meeting the three socio-economic Challenges.

Coordination of research and innovation

AAT.2013.7-1. Coordinating research and innovation in the field of Aeronautics and Air Transport

CSA-CA - Call: FP7-AAT-2013-RTD-1

Content and scope: The action will provide on an annual basis a review of the state of the art of research and innovation (capacity, main performers), identify of gaps in the research landscape, bottlenecks to innovation (regulation, financing) and formulate strategic recommendations to address these. On the basis of on-going and completed projects, the action will also assess the impact of the EU-funded projects and their contribution to progress towards ACARE goals or other relevant goals. The action will develop a web-site that centralises information and links to the relevant project in a comprehensive way, consider the relevance of setting-up a central database for projects. Dissemination of the findings will be organised through workshops. The action will also favour joint dissemination events for projects dealing with similar fields and will examine and promote conferences. The partnership will be solely composed of stakeholders that are actively engaged in research in the domain of the coordination action and represent industry, academia and research centres. The action will ensure close coordination with similar initiatives of this type in the same domain or in connected domains.

A proposal should address no more than one of the following domains:

- 1) Environmental related research and innovation (CO₂, NO_x, noise, recyclability, air transport system modelling (incl. technology evaluation), typically gathering project results from topics such as Flight Physics, Aerostructures, Propulsion, Noise, and some ATM and Airports)
- 2) Cost Efficiency (Design Systems and Tools, Production, and Avionics)
- 3) Time Efficiency (Airports, ATM, aircraft separation, etc.)
- 4) Safety research (Coordination of Safety research, support to Safety Management System for Europe, and ATM). Security aspects can be addressed, but safety should remain the main focus.

Up to one project per domain is expected to be funded (see section III.1.1). A duration of 4 years is recommended.

Expected impact: It is expected that the actions will enhance the coherence of strategic research policy making, impact assessment and dissemination in the field of aeronautics and air transport.

AAT.2013.7-2. Coordinating research and innovation in the field of sustainable alternative fuels for Aviation

CSA-CA - Call: FP7-AAT-2013-RTD-1

Content and scope: The coordination action will address the research and innovation in the field of sustainable alternative fuels for aviation, including related technical, environmental, business and economic aspects. It will assemble and link initiatives and projects in the EU Member States and at the EU level in that field. More specifically the action should:

- 1) Develop and implement a strategy:
 - for sharing information and where appropriate coordinating initiatives, projects and results/data, helping in building relationships and public-private cooperation;
 - to identify needs in research, standardisation, innovation/deployment, and policy measures at European level and for this liaise with the European Biofuels Flight Path initiative, the European Biofuel Technology Platform (EBTP) and with relevant initiatives at international level (e.g. USA and Brazil); and
 - to promote the specific needs of the aviation sector in the energy and other relevant communities across Europe, (energy at large, bio-energy and fuels, agriculture, chemistry, bio-chemistry, the financing sector).
- 2) Establish and implement a strategy in liaison with the European Bio-Technology Platform for the independent mapping and assessment of projects in this field with collection of the lessons learned. For this assessment, experts from industry, science, NGOs and other relevant background, as well as policy makers, might participate. The results should be accessible to public decision makers, and also to private, subject to a strategy on confidentiality and IPR.
- 3) Organise the collection of information from related workshops and other events; make information available to public and private decision makers. Organise dedicated workshops if appropriate.

The partnership will be composed of key stakeholders that are actively engaged in research and innovation in the field of sustainable alternative fuel for aviation and include industry, academia and/or research centres and relevant public authorities. The action will build on the recommendations of the SWAFEA report, the ACARE Strategic Research and Innovation Agenda, the European energy, climate and transport policy framework and the SET-Plan.

Expected impact: It is expected that the actions will enhance the knowledge of decision makers on sustainable alternative fuels for aviation and their use, the coherence of strategic research policy making, impact assessment and dissemination in the field of sustainable alternative fuels for aviation.

Actions in support of research and innovation

AAT.2013.7-3. Communication of EU funded RTD project results to targeted audience

CSA-SA - Call: FP7-AAT-2013-RTD-1

Content and scope: The goal is to disseminate publicly funded research results in a targeted manner to secondary and engineering schools. The project is expected to produce attractive educational materials, such as videos or serious games explaining simple physical principles, experiments and results, based on at least 20 Aeronautics and Air Transport RTD projects.

They would be adapted for use by teachers in secondary or engineering schools and be produced at least in English, in a way which would allow easy transformation to other languages. They would be distributed via targeted social networking platforms. The consortium should include experts in aviation and education.

Expected impact: The action is expected to raise the interest of young Europeans and promote scientific and technical studies and careers in aeronautics and air transport research and industry.

AAT.2013.7-4. Creating cohesive links and common knowledge between potential partners in EU Framework Programme Collaborative Projects

CSA-SA - Call: FP7-AAT-2013-RTD-1

Content and scope: The goal of the action is to put in direct contact potential coordinators and potential partners in EU Framework Programme Collaborative Projects in the field of Aeronautics and Air Transport (AAT), which are established in regions that lack of mutual knowledge. The project will first establish a thematic mapping of regional capacities and identify the regions which have a low participation in Collaborative Projects compared to their capacity and which would benefit from better connections in the different technology areas, in particular between Eastern and Western Europe. The major part of the action effort should bear on the organisation of workshops, plant and factory tours centred on defined technology areas of common interest (e.g. engine, aero-structures, avionics, etc.), organised locally and aiming at creating direct links between research stakeholders from industry, academia and research centres. The consortium partnership should be composed of regional associations, with a suitable balance between the regions.

Expected impact: The action is expected to reinforce networks of actors and widening opportunities in research and innovation, thus strengthening the European Research Area in the field of AAT.

AAT.2013.7-5. Conference: support for the organisation of Aerodays

CSA-SA - Call: FP7-AAT-2013-RTD-1

Content and scope: The action will prepare and provide support to the European Aeronautics Days, a conference which brings typically together over 800 representatives of Aeronautics and Air Transport (AAT) stakeholders from all over Europe and beyond around research and innovation results and policy. The objective of the conference is to provide a platform for discussing political, industrial and research issues on a European and global scheme, assisting a policy, which pursues a smart combination of top-down and bottom-up approaches. In line with previous Aeronautics Days, the event should address the technological and industrial developments of the aviation sector providing a high-level, future oriented perspective coming from politics, the industry and the research community, in response to Europe's social needs and expectations. The conference should also offer a forum for government officials, decision makers, managers, researchers, engineers and journalists from all over Europe and beyond to discuss and reflect on an RTD roadmap for aeronautics in line with Europe's Vision for Aviation 'Flightpath 2050'. In collaboration with the relevant actors, such as the European Commission services, the action will define the overall planning of the conference, structure the technical and political sessions of the event, contribute to select the appropriate location for the venue and offer operational IT tools for the registration of participants, the handling of speakers' contributions, etc. Specific attention should be put on the participation of students and young researchers.

Expected impact: The action will contribute to disseminate the results of AAT EU funded research and to raise the visibility and weight of the EU policy in the field. It will allow creating links and exchanges between research and innovation stakeholders and policy makers.

AAT.2013.7-6. Enhancing coordination and stimulating cooperation in research and innovation among EU Member States and Associated States to the EU Framework Programme

CSA-SA - Call: FP7-AAT-2013-RTD-1

Content and scope: The action will set up a platform of communication between national organisations and governmental institutions supporting research and innovation in the EU Member States and Associated States to the EU Framework Programme in the field of Aeronautics and Air Transport (AAT), in particular considering AAT intensive regions. The activities will include the organisation of workshops and studies on areas of common interest. Win-win situations, barriers and solutions for improved trans-national cooperation in research, technological developments and innovation will be identified and recommendations made for future actions. The action will focus on AAT, encompass interested EU Member States and Associated States and contribute to:

- strengthening and widening the network established under previous ERA-NET schemes;
- providing an overview of the different types of actions, their focus and the financial resources provided by public authorities (including for transnational joint calls where relevant);
- stimulating practical opportunities to develop cooperation in research and innovation;
- strengthening and widening coordinated approaches towards international co-operation;
- supporting transnational cooperation in education and workforce mobility;
- enhancing transnational cooperation for infrastructure;
- acting as a vehicle for stimulating co-operation of national funded research in support of technology initiatives on European scale such as Horizon 2020, Clean Sky, SESAR, etc.;
- maintaining an active exchange of information and acting as linkage to avoid duplication of effort between different networks and institutions in AAT; and
- creating means of communication among national mirror groups of ACARE.

Expected impact: It is expected that the support action will maintain existing links and establish new links between EU Member States and Associated States and stimulate the creation of transnational cooperation mechanisms in AAT.

AAT.2013.7-7. Exploring opportunities and stimulating cooperation in research and innovation with China

CSA-SA - Call: FP7-AAT-2013-RTD-1

Content and scope: The action will set up a platform of communication between research and innovation oriented organisations (industry, research establishments and academia) and institutions in Europe and China in the field of Aeronautics and Air Transport (e.g. environmental impact, safety, security and the interoperability of operational systems). The activities should include the joint organisation of workshops and studies to identify preferred areas of common interest and win-win situations with a forward looking perspective. Barriers

preventing cooperation in research, technological developments and innovation will be identified. Solutions will be proposed and recommendations made for future actions. The action will also stimulate practical opportunities to develop cooperation in research and innovation, taking into account the on-going cooperation initiatives.

Expected impact: It is expected that the action will identify on a win-win basis research and innovation topics of common interest in the field of AAT and stimulate the creation of cooperation mechanisms.

COORDINATED CALLS FOR INTERNATIONAL COOPERATION

AAT.2013.8-1. Coordinated call with Russia

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-RUSSIA

Content and scope: In the proposed research and development work, proposals should fully target one of the following domains of common interest and demonstrate the complementarity with past and on-going projects in the field in Europe and the Russian Federation.

- 1) *Reliable novel composite aircraft structures based on geodesic technology.* The proposed work should increase the Technical Readiness Level (TRL) of the geodesic technology and deploy its full potential. While the global structural behaviour of composite geodesic structures is investigated and understood, for higher TRL the understanding of the local structural behaviour, which is different from today's aircraft structures, is necessary. Of particular interest is the robust design, manufacturing and structural behaviour of the grid nodes and the rib-skin interface of the composite geodesic structure. The work should include numerical analysis as well as impact and fatigue testing from coupon to detail level. New confident and suitable repair concepts of these structures should also be envisaged
- 2) *Theoretical and experimental study of flow control for improved aircraft performance.* The proposed work should investigate theoretically and experimentally flow control strategies using for example, mechanical means, jets and/or plasmas in order to improve the performance of the aircraft in all phases of flight (take-off, cruise, landing). For the take-off and landing phases, emphasis will be put on improved safety while manoeuvring under high angles of attacks. During the cruise phase, the impact of active flow control (e.g. employing tangential blowing of a jet over the rear portion of the fixed wing) on the performance of high-speed/high-lift supercritical airfoil sections and swept wings will be investigated in particular in the perspective of allowing an increase of the cruise Mach number (up to 0.85–0.9 and higher).
- 3) *Rational architecture of aircraft control system actuation part for more electrical aircraft.* The proposed work should contribute to analyse different architectures involving more electric technologies for the aircraft control system making enhanced use of smart electrical actuators. The requirements in terms of power and dynamic characteristics of the electrical actuators will be determined for the different control surfaces. Enhanced electrical actuators capable of answering these requirements will be investigated.
- 4) *Computer aided design (CAD)-generated modular avionics.* The proposed work should develop the scientific and technological fundamentals needed to evolve towards CAD-generated modular avionics based on the principles of a uniform set of hardware and

software components. The research and developments will target the next generation of airborne systems with open architecture including, for example diagnostics, in particular using self-conditioning means, observation and control functions, on board situation awareness for improved safety, etc.

- 5) *Innovative counter-rotating fan system with high by-pass ratio.* The proposed research and development work should focus on counter-rotating fan systems with high by-pass ratio and target high fuel efficiency, competitive with levels of open rotors, and a low acoustic signature, taking advantage of the existence of a nacelle to include acoustic treatments. Proposals will involve multidisciplinary research and propose solutions for enhanced integration of the propulsion system with the airframe.
- 6) *Enhanced compressor performance.* The proposed research and development work will target the improvement of the efficiency of compressor for advanced turbofan and enhanced stability margin. It will involve both experimental and computational studies. Steady and unsteady phenomena will be investigated, in particular under conditions representative of a highly loaded compressor. Specific attention will be paid to the robustness of the compressor behaviour when experimenting inlet distortions. A selection of casing treatment configurations that have the potential to enhance the compressor stability will be investigated and validated on a test rig.

Expected impact: It is expected that the project will enhance further the cooperation in research and innovation between EU and the Russian Federation in the field of civil transport aircraft.

AAT.2013.8-2. International cooperation on civil high speed air transport research

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-HIGH SPEED

Content and scope: The project goal is to perform flight testing of (a) multidisciplinary optimised model vehicle(s) in the hypersonic range relevant to an environmentally and economically sustainable civil high-speed passenger transport aircraft. The flight test(s) will aim at validating a range of concepts such as integrated aerodynamic design of vehicles, propulsion systems (including intakes), aero-propulsive balance, sonic boom reduction, high temperature materials and structures, flight control, etc. The model will be equipped with the relevant instrumentation in the view of comparing measurements with predictions. While the development of a high speed transport aircraft is to be envisaged on a long term perspective, the proposal will also highlight spin-off applications to other sectors in a shorter term.

The proposal shall be established together with coordinated, compatible, balanced and coherent proposals or projects from at least two of the following countries: Australia, Japan and the Russian Federation. It is required that before the signature of the EU grant agreement a coordination agreement encompassing IPR, ownership, risk sharing and coordination issues is signed between the entities participating in the EU and in the complementary Third Countries' projects. The submission, together with the EU proposal, of a formal signed commitment to conclude this coordination agreement by the entities participating in the Third Countries' complementary proposals/projects will be positively evaluated.

Expected impact: The project will allow gathering the critical mass and the means to perform flight testing for long term high speed aircraft developments and will create durable links between the EU and the international partners.

7.2. SUSTAINABLE SURFACE TRANSPORT (INCLUDING THE 'EUROPEAN GREEN CARS INITIATIVE')

I.2. CONTEXT

This introduction is complementary to the general one (section I.0). The strategy for 2013 is summarised there, including the new innovation dimension of the activities, SME relevant research, international cooperation, cross-thematic approaches and societal aspects. Only the specificities of the sub-theme are presented here.

The information provided in this introduction as well as in the content of calls for 2013 shall not be considered as eligibility criteria (unless it is explicitly indicated) but shall be taken into account during the evaluation for the respective evaluation criteria. For eligibility criteria and additional information, e.g. funding schemes, budget limits, etc., please refer to section III.

I.2.1. Specific approach for Sustainable Surface Transport

The scope of the research covers the entire Surface Transport System and embraces all its elements: products (vehicles, vessels and infrastructures), services, operations and users integrating organisational, legal and policy frameworks. The 2013 work programme is divided into two major action lines:

- 1) The three **Socio-economic Challenges** indicated in section I.0.2 are addressed by five **Activities**, which are in line with those of the Specific Programme:
 1. The greening of surface transport
 2. Encouraging modal shift and decongesting transport corridors (co-modality)
 3. Ensuring sustainable urban mobility
 4. Improving safety and security
 5. Strengthening competitiveness

In addition to the above activities, issues cross-cutting the three Socio-economic Challenges, e.g. for structuring European surface transport research and supporting programme implementation are also addressed in this work programme.

- 2) **Actions supported under the 'European Green Cars Initiative' (EGCI) and the 'Ocean of Tomorrow'**, which are also cross-cutting the three Socio-economic Challenges.

The Sustainable Surface Transport (SST) work programme covers a comprehensive and co-related spectrum of the innovation cycle, from basic and applied research to large scale and multi-disciplinary technology and socio-economic integration, validation and demonstration, including standardisation and certification where appropriate. Coordination and support actions contribute also to the structuring of European Surface Transport research and support for programme implementation.

The activities/actions are further divided in **topics** calling for **proposals**. Most topics are classified in two levels of categories according to the degree of specification of the topic

descriptions: **Level 1** (generic) and **Level 2** (specific). Funding schemes for each topic and eligibility criteria (including funding limits) are indicated in the call fiches (section III.2).

Topics in Level 1 are technology driven. Proposals may approach these topics with some degree of flexibility, by addressing only part of topic content. Research and development activities within Level 1 will contribute to the technological foundation of the sub-theme. Topics in Level 2, being specific, refer to well identified industrial, policy and socio-economic matters. They are mission driven, explicit in their formulation. They may for example give indications concerning the type of activity, the research approach, characteristics of the partnership and expected outcomes. Proposals addressing Level 2 topics will cover it entirely.

Standardisation and certification are part of the content and scope of topics at any level where appropriate (see section I.0.3).

The major part of the indicative budget allocated to the main call (section III.2) has been distributed into the following groups of topics:

- Group of topics N° 1: Increasing railway capacity
- Group of topics N° 2: Ensuring safe, green and competitive waterborne transport
- Group of topics N° 3: Implementing research for the ‘European Green Car Initiative’
- Group of topics N° 4: Ensuring sustainable urban mobility, improving surface transport through ITS, safety and security, and infrastructures.

The rest has been distributed into the topics concerning cross-cutting and horizontal activities for implementing the Transport programme (see details in section III.2.1).

Topics belonging to groups 1, 2 and 4 are described under the five activities of the work programme. Topics belonging to group 3 are described in a separate sub-division under the heading ‘European Green Cars Initiative’.

I.2.2. The ‘European Green Cars Initiative’

The ‘European Green Cars Initiative’ belongs to the ‘**European Economic Recovery Plan**’, an initiative to coordinate efforts and implement joint actions to contain the scale of the economic downturn and to stimulate demand and confidence. Within the Recovery Plan, the ‘**European Green Cars Initiative**’ is a series of measures boosting research and innovation aiming at facilitating the deployment of a new generation of passenger cars, trucks and buses that will safeguard our environment and lives and ensure jobs, economic activity and competitive advantage to car industries in the global market. A series of different measures are proposed: support to research and innovation through FP7 funding schemes, specific EIB loans to car and other transport industries and their suppliers, in particular for innovative clean road transport, and a series of legislative measures to promote the greening of road transport (circulation and registration taxes, scrapping of old cars, procurement rules, CARS21 initiative).

II.2. CONTENT OF CALLS FOR 2013

CHALLENGE 1. ECO-INNOVATION

The decarbonisation of the transport system and an efficient use of natural resources, i.e. eco-innovation in all transport modes and the continuation of the development of clean vehicles and vessels.

This challenge will be addressed by Activity 7.2.1 as well as by Areas 7.2.7.1 (Development of electric vehicles for road transport) and 7.2.7.2 (Research for heavy duty vehicles for medium and long distance road transport) of the European Green Cars Initiative.

Activity 7. 2. 1. The greening of surface transport

Developing technologies and knowledge for reduced pollution (air including greenhouse gases, water and soil) and environmental impact on such areas as climate change, health, biodiversity and noise. Research will improve the cleanliness and energy-efficiency of power trains (e.g. hybrid solutions) and promote the use of alternative fuels, including hydrogen and fuel cells as mid and long-term options, taking into account cost efficiency and energy efficiency considerations. Activities will cover infrastructure, vehicles, vessels and component technologies, including overall system optimisation. Research in developments specific to transport will include manufacturing, construction, operations, maintenance, diagnostics, repair, inspection, dismantling, disposal, recycling, end of life strategies and interventions at sea in case of accident²⁹.

SST.2013.1-1. Railway infrastructure optimisation and monitoring for further noise reduction

Level 2 - CP-FP - Call: FP7-SST-2013-RTD-1

Content and scope: It is fully understood that the noise level to which populations along the railway lines are submitted is largely generated and/or amplified by the infrastructure and this total noise emission is subject to limitation coming from national environmental regulations, harmonised under other European legislative instruments. Even if noise-reduced solutions for tracks and infrastructure are partly available from the design solutions, new solutions addressing the whole life of the infrastructure and its component have to be developed.

The research activities should include:

- Better understanding of the track contribution in the total pass-by noise of the train.
- Harmonisation of monitoring of track roughness and average characteristic wheel roughness.
- Monitoring track dynamic properties with respect to noise emission.

²⁹ The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

- Optimisation of track vibration and noise radiation in relation either by combining of already prototype solutions developed separately or by radical design (including slab track).
- Investigation of influence of track characteristics on aerodynamic noise sources.
- Investigation of influence of ground geometry and characteristics close to the track on noise propagation at low frequency.
- Investigation of influence of infrastructure maintenance and consideration of the whole life cycle in relation to noise emission
- Development of noise management tools, and determination of best-test methods for characterisation of Noise Reducing Devices Insertion Loss.

Expected impact:

- Development and standardisation of operational monitoring systems for track based on the track emissions parameters identified in the Noise Technical Specification for Interoperability (TSI): Acoustic roughness and Track Decay Rates.
- Development of innovative solutions (design) for a reduction of track related noise.
- Development of concepts and tools for economic maintenance of track considering the whole life-cycle with the aim to achieve a track optimisation and further noise reduction.
- Contribution to the expected revision of TSI – noise.
- Development of a test procedure for in situ characterisation of NRD Insertion Loss.

SST.2013.1-2. Towards the zero emission ship

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Content and scope: Research will focus on the optimisation of the energy chain of a ship (maritime or inland waterway), including the integration of renewable energy systems, on energy recovery systems from the main and auxiliary engines with the aim to significantly reduce CO₂ emissions as well as SO_x, NO_x, particulate matter (PM), etc. Solutions will be implemented on ships with optimised propulsion chains.

Activities will include:

- Optimal integration of renewable energy systems in the energy chain of complex ships.
- Development of optimised solutions for a wider use of alternative fuels including deployment options.
- Development of innovative technologies for energy recovery, in particular in the low range temperature, and energy integration and respective deployment options, including storage.
- Development of novel after-treatment technologies for CO₂ reductions, taking into account energy optimisation, further development and optimal integration of existing technologies for the treatment of other types of emissions (i.e. SO_x, NO_x, PM, etc.).
- Development of concepts for an optimal integration of the energy chain of complex ships including their validation with data obtained from measurements under realistic conditions, including ice conditions. Physical mock-ups on critical parts of the energy chain will be built and demonstrated.
- Modelling of fully optimised complex ships in various operation conditions, including ice conditions, taking into account all appropriate measures for CO₂ reduction as well as measures to reduce other emission types.

- Development of reliable methods and tools for the assessment of CO₂ emission over the entire life time of a ship, including cost-effectiveness assessment.
- Assessment of the potential for market uptake and business potential of the different technologies developed and expected market barriers or bottlenecks. Development of a concept for raising the awareness of industry and public administrations regarding the potential of these new technologies for the reduction of ship emissions.

Activities will take into account the latest technology development in the field, in particular EU-funded research projects. Participation of SMEs active in equipment design, production and/or installation will be considered an asset. Proposals will clearly indicate the baseline in terms of CO₂ emissions as well as other emissions and the progress (reduction %) expected as a result of research. Targets will be benchmarked against existing “green vessels” concepts.

Expected impact: This research is expected to reduce energy consumption and thus CO₂ emissions by at least 20% compared to state-of-the art vessel technology through an optimal integration of leading edge technologies for emission reduction and energy efficiency without compromising ship safety or security, whereas other emission types will be reduced to a minimum. This will contribute to the roadmap to a single European Transport Area, which sets an ambitious target to reduce the EU CO₂ emissions for maritime transport by 40% (if feasible 50%) by 2050 compared to 2005 levels.

SST.2013.1-3. ERA-NET Plus ‘Advanced systems, materials and techniques for next generation infrastructure’

Call: FP7-ERANET-2013-RTD (see Annex 4)

Content and scope: A fundamental shift in the performance of road transport requires a new generation of infrastructure. The main aim of this ERA-NET Plus is to launch a joint transnational call for proposals for research, development and innovation in the field of advanced systems, materials and techniques for next generation road infrastructure. The joint call will focus on techniques using advanced materials, including those from other industries or from using conventional materials in an innovative way. Actions under this joint call will include the development of sophisticated modelling techniques or the testing and monitoring of novel techniques with regard to its impacts on reliability, safety and environment.

Cooperation with the USA in the respective areas should be sought. Care should be taken to ensure complementarities with the activities carried out in the ERA-NET ROAD.

The thematic focus of this joint transnational call should be proportionate with the funds available in order to ensure a reasonable rate of success in the call. Details on the topics covered by the call will be decided by the participants in due time but shall be selected upon consultation with the concerned Commission services. Funding of projects will be on the basis of a common pot.

Additional information: The deadline included in the call FP7-ERANET-2013-RTD applies for this topic. More information about the ERA-NET Plus actions (including eligibility criteria) can be found in Annex 4 of the work programme.

Expected impact:

- Improving coordination and reduce overlap in research and innovation in the field of affordable green materials and technologies for reliable road infrastructure.

- Achieving critical mass and ensure better use of limited resources in fields of mutual interest. A significant participation of Member States and Associated States is expected.
- Sharing good practices in implementing research programmes.
- Promoting transnational collaboration and generating new knowledge and innovation
- Mobilising SMEs in transnational projects to enhance innovation.

CHALLENGE 2. SAFE AND SEAMLESS MOBILITY

The optimisation of the global efficiency and safety of the transport system (by application of Intelligent Transport Systems and logistics), making efficient use of infrastructure and network capacity, with the aim of offering safe and seamless transport and mobility to all European citizens, as transport is also crucial for social inclusion.

This challenge will be addressed by Activities 7.2.2, 7.2.3 and 7.2.4, as well as by the European Green Cars Initiative.

Activity 7.2.2. Encouraging modal shift and decongesting transport corridors

Developing and demonstrating seamless door-to-door transport for people and goods as well as technologies and systems to ensure effective intermodality, including in the context of rail and waterborne transport competitiveness. This includes activities addressing the interoperability and operational optimisation of local, regional, national and European transport networks, systems and services and their intermodal integration in an integrated approach. The activities will aim at European-wide strategies, optimised use of infrastructure including terminals and specialised networks, improved transport, traffic and information management, enhanced freight logistics, passenger intermodality and modal shift strategies to encourage energy efficient means of transport. Intelligent systems, new vehicle/vessel concepts and technologies including loading and unloading operations as well as user interfaces will be developed. Knowledge for policy making will include infrastructure pricing and charging, assessments of European Union transport policy measures and trans-European networks policy and projects³⁰.

SST.2013.2-1. Next generation of train control systems in the domain of urban and main line European railway systems

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Content and scope: The research focuses on the next generations of train control systems for the two domains of urban and main line European railway systems. The goal of the project is to deliver specifications describing the new features of these next generations, leading to common technical architecture and associated standard interfaces within each of the two domains.

The research activities should include:

³⁰ The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

- Introduction of new technologies in the ERTMS (European Rail Traffic Management System) standard architecture to fit further requirements from railways undertakings.
- Investigation of next generation of ERTMS common technical specifications and their associated standard interfaces.
- Further development of CBTC (Communication Based Train Control) based control systems including both on-board and wayside equipment and associated standard interfaces.
- Investigation of various possible higher industrial synergies between the control systems of the two domains, in terms of specifications for on-board and wayside equipment, certification processes, as well as facilitation of trans-border operations between the main line and sub-urban systems.

Expected impact:

- Delivery of Functional Requirement Specifications (FRS), Systems Requirements Specification (SRS) and Functional Interface Specification (FIS) for the next generation of ERTMS.
- Development of a common technical architecture and its associated standard interfaces for urban train control systems including delivery of related FRS, SRS and FIS specifications.
- Development of assessment methods and installation procedures for next generation of ERTMS and CBTC.
- Harmonisation of main line / urban rail train control systems development.
- Increase of capacity, reliability and availability for regional lines, freight lines and high-density lines and for urban rail systems.

SST.2013.2-2. New concepts for railway infrastructure and operation: adaptable, automated, resilient and high-capacity

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Content and scope: The project should pave the way for an affordable railway infrastructure (low maintenance and rapid construction) and operations concept that is resilient to extreme weather and other hazards, designed for automated maintenance and operations (e.g. automated coupling, brake testing), and adaptable to different route characteristics including (very) high speed. At the same time, it should contribute to an increase of capacity of freight transport.

The research activities could include:

- Infrastructure for medium/long distance mixed traffic – designs for low maintenance, low carbon, rapid construction including prefabricated track with provision for integrated power systems and communications
- Very high speed track - for speeds over 350km/h, requirements for structures design criteria related to dynamic analysis: bridge-vehicle interaction, transition zones, damping considerations and the effect of track irregularities. Compatibility with high-speed freight should be investigated.
- Switches and Crossings for the railway of the future - the development and demonstration of alternative designs for switches and crossings phasing out all currently known failure modes and incorporating optimised sensor technologies.
- Development of innovative and cost effective technologies for collecting real-time data on the train operation (current train position, the current delay, reason of delays, details

on operational problems and the estimated time of arrival at relevant operation points) as well as technical data (train weight, wagon list, etc.).

- Development of innovative solutions for traffic capacity computation for freight and passengers based on data gathering, analysing and utilising processes. Determination of data requirements and models to improve rail punctuality and level of service.
- Development of innovative operational measures and technologies reducing the time and operational cost related to the transshipment between rail and other modes
- Development of joint requirements and testing for incident management plans.
- Structural health monitoring for railway infrastructure.
- Longer trains and/or high-speed freight, addressing automated coupling, improved braking technology and planning aspects allowing the interleaving of slower freight trains with regular and high-speed passenger traffic.

Expected impact:

- Contribution to the development of future specifications for technologies and systems.
- Development of guidance documents setting out the above and identifying the technologies and systems that should be developed to ensure their delivery.
- Practical demonstration that step change in railway infrastructure and operations may be achieved within the constraints of the need to maintain railway services. Case studies for selected sites, including one or more European Rail Freight Corridors are desirable.
- The project is expected to identify possible follow-up actions to be supported through other sources of funding, thus widening opportunities for future deployment.

Activity 7.2.3. Ensuring sustainable urban mobility

Focusing on the mobility of people and goods by research on the ‘next generation vehicle’ and its market take-up, bringing together all elements of a clean, energy efficient, safe and intelligent transport system. Research on new transport and mobility concepts, innovative organisational and mobility management schemes and high quality public transport will aim at ensuring access for all and high levels of intermodal integration. Innovative strategies for clean urban transport³¹ will be developed and tested. Particular attention will be paid to non-polluting modes of transport, demand management, rationalisation of private transport, and information and communication strategies, services and infrastructures. Tools and models supporting policy development and implementation will cover transport and land use planning including the relationship with growth and employment³².

SST.2013.3-1. Managing integrated multimodal urban transport network

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Content and scope: Research will aim at developing, demonstrating and validating strategies and tools (technological and methodological), which contribute to integrated multimodal network management for cities and their hinterland. Strategies can address the movements of goods and people on the network as well as the improvement of the accessibility.

³¹ Building upon the experiences of the CIVITAS initiative (www.civitas-initiative.org).

³² The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

The project will develop an integrated approach and will focus its research and demonstration activities on the following areas of innovation:

- Data creation and use: innovative and cost-effective detection technologies leading to create, share, disseminate and use real-time data collection on people and vehicle movements, particularly for soft modes and public transport; open data systems - approaches, business models and contractual arrangements.
- Open ITS systems:
 - opened standards and specifications for data exchange, including open traffic and communication systems; and
 - generic interface between digital applications relating to future urban infrastructures and ITS reference architecture inside vehicles.
- Decision support tools for city operators, citizens, industries (both transport mobility user and supplier):
 - innovative operational and strategic decision-support systems, which can balance safety, environment and efficiency aspects of traffic and infrastructure management;
 - integrated traffic control involving real time coordination among road and transport operators and emergency services; and
 - multimodal modelling and simulation covering road vehicles (including public transport), road infrastructures and soft modes oriented to different user categories.
- New mobility information services for passengers and freight transport including multimodal cooperative mobility for local authorities (with migration scenarios). The aim is to develop and integrate the best mobility solutions for an optimum between mobility demand and supply activities; especially, to ensure coherence between the different level of governance for both freight and passengers.

The project will include demonstrations of several of the above areas of innovation in different pilot cities across Europe. Each demonstration will involve several modes of transport including public transport. Pilot cities would preferably be characterised by different: topologies, means of transports, urban dynamics, socio-economic and cultural trends, city growth and development profiles. The outcomes should be the development of new integrated mobility services and associated products (e.g. predictive and decision support tools for city authorities, personal travel assistant and IT tools for users,...). The project will also develop guidelines for network managers on the research actions listed above.

Strategies can address the movements of goods and people on the network. Specific technological, operational and governance aspects have to be taken into account as well as efficient use of existing services, platforms and solutions already tested and capable to provide some of the key functionalities.

The project will gather multi stakeholder partnerships including local authorities (as policy/decision makers, infrastructure managers, traffic operators, and mobility services providers), public transport authorities/operators, information service providers, traffic system suppliers and technology developers. It will establish links with the Digital Agenda, the EC open data strategy and the ITS and Urban Mobility Action Plans (it should be based on and take into account the work and guidelines developed by the Urban ITS Expert Group) and build on past and existing research activities on urban network management (CONDUITS,

EBSF, CVIS, SMARTFREIGHT, 2DECIDE, EU-SPIRIT³³). Appropriate links with CIVITAS activities should be established.

Expected impact:

- Contribute to more efficient integrated multimodal network management for cities and their hinterland.
- Upgraded methodologies and tools for traffic planning and operations enabling integrated and multi-modal management.
- Progress towards open systems for traffic solutions enabling a faster market deployment of ITS in urban areas.
- Improved understanding of people mobility behaviour and freight movements across the modes, especially public transport and soft modes.
- Integration of public transport and soft modes in traffic planning and operations, including in supporting ITS.
- Improved user experience in multimodal transport services
- Support the use of standards to achieve open traffic systems (in particular for data model and data exchange interfaces) in order to accelerate dissemination.
- The project is expected to identify possible follow-up actions to be supported through other sources of funding, thus widening opportunities for future deployment.

SST.2013.3-2. Implementing innovative and green urban transport solutions in Europe and beyond

Level 1 - CSA-CA - Call: FP7-SST-2013-RTD-1

Content and scope: The active take up and transfer of experience between European cities and cities across the world can accelerate the deployment of innovative and green urban transport solutions.

The aim of this action is twofold:

- 1) To develop and implement the take-up of innovative and green urban transport solutions (e.g. network management, clean vehicles, public transport, transport infrastructure, city logistics) which are adapted to the specific framework conditions of cities across the world. Beyond a structured take up of innovative solutions, the action will develop recommendations for future cooperation between European cities and cities across the world and in particular from Latin American Countries, China and Singapore.
- 2) To share experiences of topic of common interest and propose innovative and green urban transport solutions (e.g. in the area of public transport, transport infrastructure, city logistics) which are adapted to the specific framework conditions of cities from Mediterranean partner countries. The action will develop recommendations for future research cooperation.

The proposal should take into account the results of previous and on-going EU research activities on international cooperation³⁴ and other projects which have developed results at

³³ More information on the projects can be found on the website of the Transport Research Knowledge Centre (<http://www.transport-research.info>)

³⁴ Such as the FP7 projects SIMBA, VIAJEO and STADIUM on ITS, TRANSAFRICA on public transport, TURBLOG on city logistics, and EUTRAIN on international cooperation in transport research. More information on the projects can be found on the website of the Transport Research Knowledge Centre (<http://www.transport-research.info>).

European level of great interest for international cooperation.³⁵ Appropriate links with the related bilateral research cooperation frameworks should be established.

Expected impact:

- Foster the deployment of innovative transport solutions in Europe and across the world to address global challenges and contribute to reach the objectives set up by the European Union in terms of sustainable urban mobility, energy efficiency and fight against climate change.
- Support the structured transfer of innovative transport solutions promoted by the European industry to other regions of the world, thus contributing to the competitiveness of European companies.
- Contribute to a better global dialogue among policy makers and practitioners in urban transport from Europe and other industrialised and emerging countries.
- Develop research cooperation with Mediterranean partner countries in the field of urban transport.

SST.2013.3-3. Capitalising CIVITAS knowledge and experience

CSA-CA - Call: FP7-TRANSPORT-2013-MOVE-1

Content and scope: The aims are to capitalise knowledge gained in previous CIVITAS ('City-Vitality-Sustainability' or 'Cleaner and Better Transport in Cities' initiative) phases, strengthen the role of public authorities in stimulating transport innovation, and provide a bridge to the Union's next research and innovation programme. This action should promote wider uptake of CIVITAS measures and develop capabilities relevant to the transport White Paper goals, building on existing support actions - including POINTER, VANGUARD and CATALIST - as well as relevant projects funded under CIVITAS, ELTIS, etc. Actions should include:

1) Development of CIVITAS Thematic Groups: Centred around a core of CIVITAS cities, Thematic Groups comprising a broad range of interested stakeholders will be established for the eight CIVITAS measure categories and for areas such as transport planning, citizen engagement, etc. Thematic Groups will stimulate programme-level knowledge transfer, dissemination, and long-term evaluation.

2) Establishment of CIVITAS Advisory Groups: Based upon CIVITAS experiences, Advisory Groups will support development and implementation of strategic initiatives, anticipating the Union's next research and innovation programme, and informing EU urban mobility policies in the Action Plan on Urban Mobility and the White Paper 'Towards a single European transport area', etc. Advisory Group coverage should include, but not be limited to:

- Sustainable Urban Mobility Plans, urban mobility performance audits and Urban Mobility Scoreboard
- Quality public transport and co-modality
- New mobility concepts for personal transport
- Sustainable urban logistics
- Access restrictions

³⁵ Such as NICHES and NICHES + on the take up of innovation for a more sustainable urban mobility, EBSF on public transport, and CITYMOVE, CITYLOG and SMARTFREIGHT on urban logistics. More information on the projects can be found on the website of the Transport Research Knowledge Centre (<http://www.transport-research.info>).

- Safe walking and cycling
- Understanding and promoting behavioural change
- Role of public procurement schemes in stimulating market introduction of innovative transport systems
- International co-operation
- Other such working groups as may be relevant to White Paper objectives

The coordination action will provide the secretariat for groups. Each Advisory Group should include, as appropriate, public- and private-sector experts, the research community and legal and financial expertise. Activities could include reviews, surveys of CIVITAS Forum cities, elaborating deployment strategies covering the full innovation cycle; identifying RTD&I priorities; assessing technical and non-technical barriers and policy options and delivery mechanisms that could accelerate deployment, such as public procurement schemes. Sufficient budget should be foreseen to cover experts' expenses associated with the work of the Advisory Groups and to provide for supporting studies, etc.

3) Professional Placements / Exchanges: Support for short-duration placements and exchanges for transport practitioners should be offered on a competitive basis. Placements may involve “lead” cities from the CIVITAS network, able to offer exchanges and /or host training to “learning” city practitioners.

4) Take-up actions: Building on CATALIST, GUARD and NICHES+, this action will develop suitable implementing procedures, involving experienced “lead” cities from the CIVITAS network willing to offer support for transferring know-how of successful measures to “learning” cities – based on competitive calls and on analysis of transferability potential. A CIVITAS Activity Fund will be managed to provide partial financial support to beneficiaries of take-up activities (typically entities from small and medium sized cities not actively participating in CIVITAS). The consortium will build on the approach followed for the previous CIVITAS Activity Fund. This activity should assimilate the results and establish links with the projects under topic SST.2012.3.1-3 “Take-up of transport innovation in urban and regional transport”. This take-up action shall be managed in conformity with the provisions set out in the Financial Regulation and implementing rules applicable to the general budget of the European Communities.

5) CIVITAS National/regional Networks: Budget will be set aside to establish complementary or maintain existing national/regional networks to promote awareness, ensure results dissemination and take-up following the approach taken in already established CIVINET networks.

The coordination action will initiate establishment of the groups in consultation with the Commission – including drafting terms of reference, initiating and managing requests for expressions of interest to participate, convening and managing group meetings, and preparation of group strategy documents. Deliverables will depend on the activity / theme, but will normally include an international state of the art review, technical reports and a strategic plan (action plan) including recommendations for priority actions and indicative budgets for future actions. This support action is required to establish links with the support actions POINTER, VANGUARD, CATALIST and projects supported under topic SST.2012.3.1-3.

Expected impact:

- Stimulate public authorities to introduce innovative transport technologies and systems.

- Detailed recommendations and strategy for priority actions which support delivery of the White Paper and Action Plan goals for sustainable urban mobility.
- Further dissemination, transfer and replication of successful CIVITAS measures.
- Consolidation and structuring of experience and knowledge developed in CIVITAS with a view to informing policy at EU, national and local levels.
- Exploit linkages with other relevant FP7 activities related to urban mobility.
- Grow CIVITAS national networks and CIVITAS Forum membership.
- Capacity building through short duration professional exchange/placement activities.
- Concepts for public procurement schemes and their potential impact on transport system innovation.

Activity 7.2.4. Improving safety and security

Developing technologies and intelligent systems to protect vulnerable persons such as drivers, riders, passengers, crew, and pedestrians. Advanced engineering systems and risk analysis methodologies will be developed for the design and operation of vehicles, vessels and infrastructures. Emphasis will be placed on integrative approaches linking human elements, structural integrity, preventive, passive and active safety including monitoring systems, rescue and crisis management. Safety will be considered as an inherent component of the total transport system embracing infrastructures, freight (goods and containers), transport users and operators, vehicles and vessels and measures at policy and legislative levels, including decision support and validation tools; security will be addressed wherever it is an inherent requirement to the transport system³⁶.

SST.2013.4-1. Ships in operation

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Content and scope: The aim of this research is to ensure the safety of ship operations in view of the introduction of new IMO (International Maritime Organisation) standards related to energy efficiency, in particular the EEDI (Energy Efficiency Design Index). Starting from the new IMO regulations, particular focus will be given to the development of right methods, tools and procedures to facilitate and support the safe design and operation of a wide range of ships in compromised situations, in severe seaways, in restricted waters and during manoeuvring, accounting also for interaction with other vessels, maritime structures and the environment. Furthermore, focus should also be placed on the necessary safety requirements of other types of vessels, currently not covered by the EEDI, such as tugs and offshore service vessels in anticipation of future energy efficiency requirements for these segments.

Activities will include:

- The development of high fidelity tools and processes for accurate and efficient analysis of safety and performance sensitive hydrodynamic problems in complex and/or extreme sea operational conditions, including intact stability performance (surfing/broaching, rolling, extreme motions) and added resistance.
- Extension and validation of hydrodynamic analysis codes for ships manoeuvring performance in safety-sensitive environment such as confined waterways, including

³⁶ The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

particular aspects of shallow water hydrodynamics and slow speed behaviour as well as the interaction with other vessels and stationary structures in diverse environment and weather conditions.

- Adaptation of multi-objective optimisation and integrated design environments for holistic operational performance and minimum powering requirement predictions to ensure safe application of the design rules guaranteeing at the same time the right balance between safety, economic efficiency and greenness.
- The provision of technical input position paper to the Commission based on the project results to support, when requested, the activities of EU services within the IMO framework.

Research can address all ship types, including non-cargo ships such as tugs and offshore service vessels, but proposals should clearly identify the ship type(s) as well as the condition of operation concerned by the research project. Participation of ship owners and operators, classification societies and ports will be considered as an asset.

Expected impact: Results should contribute to enhance the safety of vessels in compromised situations while respecting regulatory environmental constraints. Projects will contribute to the strengthening of technical knowledge as inputs to negotiations in IMO.

SST.2013.4-2. Inspection capabilities for enhanced ship safety

CP - Call: FP7-TRANSPORT-2013-MOVE-1

Content and scope: The last decade has seen a surge in the shipbuilding markets placing the shipbuilding process and its monitoring by administrations and classification societies under unprecedented strain not only in terms of technology and resources, but also in terms of quality management and risk management. These changes need to be taken into account to improve the EU capabilities to manage ship safety and environmental risks especially (but not only) for long-term prevention. There is a need to critically consider the circumstances and changes which have taken place in the industry in the past decade and develop methodologies to identify vulnerabilities and associated risks for safety and put in place the necessary corrective actions. This should transcend the actors' routine quality and risk management practices and should be integrated as appropriate in their usual activities.

The proposals should consider:

- How to involve the key stakeholders to coordinate their efforts towards a more horizontal and harmonised approach instead of individualistic and isolated strategies for safety procedures.
- Ways to collect and use knowledge and experience gained by real incidents and near-loss cases, which currently remain neglected and unaccounted for, leaving room for these unsuppressed risks to reoccur.
- Results of relevant projects (including failures).
- Other practices (and technologies) from other sectors facing matters of compliance with safety regulation such as air transport, nuclear and refinery industries.

The aim is to provide appropriate support to recognised organisations, port state control authorities, coastal and flag administrations and shipyards by:

- Developing methodologies for improving existing risk management procedures and processes for inspections, incident detection and recording, compliance monitoring,

contingency plans and emergency responses which address risk issues arising from the current practices in shipbuilding and certification.

- Addressing the technical capabilities needed to support the implementation of the above mentioned enhanced methodologies, including the dynamic collection processing and use of real time information.

Through the close cooperation and involvement of the relevant actors, the prospective project should assist the recognised organisations to fulfil their obligations under Regulation (EC) n° 391/2009 to improve the effectiveness of ship plan approval, certification and inspection, and to assist the identification and monitoring of high-risk ships.

Active participation of class, ship-owners, shipyards, equipment manufacturers, maritime authorities and researchers would be a critical success factor. The review of the above mentioned actors' current policies, strategies and the operational responses will be fundamental for this activity. The results should lead to the development of a comprehensive preventive policy.

Expected impact: The expected impacts are the enhancement of the above mentioned actors' current policies, strategies and the operational responses and the development of a comprehensive preventive policy, which will be based on:

- Methodologies and tools:
 - Enabling recognised organisations and regulatory authorities to assess and upgrade their risk management processes in a way that any risks generated as a result of the strain suffered by the shipbuilding and certification process as described above will be properly addressed.
 - Enabling more efficient coordination of inspection scheduling, and monitoring/managing vulnerabilities particularly by sharing information on incidents and near-loss cases.
 - Identifying and monitoring ships at risk.
 - Defining preventive actions over time, performing risk analysis, evolving risk control options, cost benefit analysis and decision making recommendations.
- Improved technologies in inspection, repair and verification of ship structures, also considering vessel health-status information through real time information from 'intelligent' sensors, enabling the realisation of more targeted and time efficient inspection processes.
- Formulation of unified risk-management tools like vulnerability databases recording critical information such as risk sources, risk evolution trajectories, near-loss incidents and efficiency of contingency procedures.

SST.2013.4-3. Biomechanics and advanced digital human body models and testing for vehicle safety

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Content and scope: Advanced vehicle safety systems of the future will have to be able to provide optimum protection to occupants of all sizes, weights and constitutions including children and elderly people with their specific biomechanical characteristics and physical movements in critical pre-crash and crash situations. For this purpose, numerical and experimental tools of the human body with increased level of details are needed. The use of digital human body models (DHBMs) and virtual testing allows covering a wide range of traffic scenarios, vehicle designs and equipment, and human diversity (size, age, gender,

disabilities, etc.) and also to develop procedures to validate vehicle subsystems such as the restraint systems.

Research will cover the following aspects:

- Development of advanced DHBMs with a clear focus on model robustness and acceptance by the industry, regulatory bodies and consumer organisations. Work should also include validation procedures and tools, standardised range of biofidelic human occupant models and statistical modelling strategies to be possibly used also for further development of crash test dummies. A clear focus on uncovered population segments such as females, children or elderly people, and uncovered characteristics in accidents conditions like submarining or misuse of restraint systems should be given.
- Virtual testing methods with a high bio-fidelity and injury prediction capability which will help to get a better understanding of human-like reactions and injury risks in road accidents. Current findings from ergonomics studies should be taken into account and be integrated into existing DHBMs to make them more suitable for virtual design of passive safety systems and for virtual crash tests.
- Methodologies, tools and numeric solutions allowing time and cost effective extension of biomechanical databases with new biomechanical properties of human bodies (like physical and physiological parameters, movements) in respect to age, sex, posture, etc. Methodologies should also be found to create and efficiently maintain a database of general motions of human bodies. A sustainable business model, including licensing of data, should be elaborated.

For the implementation of the research findings close cooperation with European and international stakeholder groups representing industry, governments and customer organisations is a prerequisite to ensure that these research outcomes will deliver future products, more effective regulatory procedures and customers' acceptance. Cooperation with partners from other parts of the world (e.g. US, Japan) should be considered.

Expected impact:

- Contribute to the best possible level of road safety, even beyond the common objective proposed by the European Commission in 2010³⁷.
- Build critical mass around International research investments in Open Source Virtual environments to develop improved injury criteria
- Better understanding of the specific biomechanical characteristics and physical movements of occupants in critical situations and accidents.
- Developing numerical tools with biofidelic kinematics and realistic injury predictions for the design and assessment of integrated safety systems.
- Recommendations and proposed methods for the implementation of numerical tools in regulations and consumer testing.
- Developing a methodology for the validation of vehicle restraint systems using virtual testing tools.

³⁷ Towards a European road safety area: policy orientations on road safety 2011-2020.

CHALLENGE 3. COMPETITIVENESS THROUGH INNOVATION

The strengthening of the competitiveness of European transport industry through innovation, as competition from developed and emerging economies is intensifying in a global economy.

Activity 7.2.5. Strengthening competitiveness

Improving the competitiveness of transport industries, ensuring sustainable, efficient and affordable transport services and creating new skills and job opportunities by research and developments. Technologies for advanced industrial processes will include design, manufacturing, assembly, construction and maintenance and will aim at decreasing life cycle costs and development lead times. Emphasis will be placed on innovative and improved product and system concepts and improved transport services ensuring higher customer satisfaction. New production organisation including the supply chain management and distribution systems will be developed³⁸.

SST.2013.5-1. Technical requirements for the certification of new materials for railway rolling stock

Level 2 - CP-FP - Call: FP7-SST-2013-RTD-1

Content and scope: The necessary decrease of the energy consumption, as well as the increase of capacity for high speed and high capacity freight trains, must be supported by lightweight railway rolling stock. Therefore the evolution of the rolling stock requires the implementation of new materials similar to those used in other industries. The first step will be to face the challenge of certification of safety related components that will make use of innovative material in an industry where safety is of primary importance.

The research activities should include:

- Benchmarking the most promising materials (being) developed in other sectors able to be implemented in the railway rolling stock industry.
- Gaining a better understanding of new materials behaviour and consequences of their use given the specific safety standards and conditions of the railway sector. Specific attention should be paid to the impact of ballast, especially by modelling.
- Investigation of the influence of the characteristics of new materials on the maintainability of rolling stock, in order to consider their use in the overall vehicle life cycle.

Expected impact:

- Identification of the requirements for the new materials in terms of reliability, maintainability and safety.
- Development of standards, especially in terms of safety, for railway rolling stock, able to allow and support the development and use of new lightweight materials.
- Reduced energy consumption of rolling stock by introduction of new lightweight materials.

³⁸ The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

SST.2013.5-2. Low cost flexible automation and mechanisation in small to medium shipyards

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Content and scope: The objective of this topic is to strengthen the competitiveness of shipbuilding industries, in particular SMEs, through innovative and cost-effective processes while developing new skills and job opportunities in this sector. Focus will be put on low cost automation and mechanisation for shipyards processes including design, engineering, basic material processing, assembly and outfitting.

For defined processes, activities should include:

- The identification of technical needs and development of cost models for low cost, flexible automation and mechanisation based on typical production volume throughput of European small-medium size shipyards building, repairing, converting and maintaining ships.
- The identification of automation solutions matching the technical requirements for design, engineering, basic material processing, assembly and outfitting, which have proven reliability within the large shipyards and are relevant for the needs of European small-medium size shipyards, including solutions from outside the shipbuilding industry.
- The development and testing of business models that include cost-effective flexible solutions for shared facilities, equipment and/or human resources.
- Demonstration of selected automation and mechanisation solutions in small-medium size shipyards with subsequent evaluation of the relevance and efficiency of these technologies, including cost-benefit aspects and human skills requirements.
- Establishment of a development scheme for adapting promising automation and mechanisation solutions to the needs of European small-medium size shipyards with focus on material processing, assembly and outfitting.
- Development of specific training programmes in the domain of mechanisation and automation specific to the shipbuilding industry.

SMEs active in the shipbuilding sector should have major roles in the consortium and share around 50% of the requested EU funding. The participation of a major shipyard will be considered as an asset.

Expected impact: Results are expected to raise the competitiveness of small-medium shipyards, reinforce the role of SMEs, and increase the availability of technical skills suitable for the shipbuilding industries. All solutions should ensure a minimal environmental impact in shipyards.

SST.2013.5-3. Innovative, cost-effective construction and maintenance for safer, greener and climate resilient roads

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Content and scope: Challenges currently facing Europe's road infrastructure network include investment at a time of economic stringency, deterioration of existing infrastructure and the susceptibility of today's road systems to climate change. Research will focus on the development and demonstration of more effective and safer design, construction and maintenance processes which will address both the renovation of existing road infrastructure

and the construction of new road infrastructure. Inherent to this is the need for common measurement systems to assess road surfaces for new and maintenance work approval. Only an optimised interaction between functional properties of roads (such as skid, rolling resistance and noise characteristics) can lead to a high level of road safety while ensuring the most positive greening effect, through reduction of CO₂ output and noise emissions, and adaptation to climate change, contributing to the health and well-being of road users and those in the neighbourhood.

Activities will cover one of the following subjects:

1) Measurement systems: Definition of standards and test methods to measure the impact of road pavement characteristics on safety, fuel consumption and environment. Two key strategic components are:

- The development of guidelines and standards supporting the objectives of European road network development and related EC priorities in terms of safety, noise, environment and energy consumption.
- The provision of harmonised measurement tools to enable consistent assessment of road surfaces properties and tyres.

Complementarity with previous activities, such as TYROSAFE³⁹, should be ensured. The participation of standardisation bodies is to be encouraged.

2) Design, construction, maintenance and management:

- Tools and techniques of road asset management and renewal, including aspects such as structures, road durability and time stability, energy consumption and environmental impact.
- The development and demonstration of products, services and guidelines for cost-effective construction and maintenance of infrastructure that address one or more of the White Paper issues such as:
 - specially developed freight corridors optimised in terms of energy use and emissions, minimising environmental impacts, improved reliability, limited congestion and low operating and administrative costs;
 - infrastructure upgrades which are resilient to foreseen negative impact of climate change such as rising sea level and more extreme weather including floods, extreme precipitation, droughts and more frequent storms; and
 - maximisation of the positive impact on economic growth while minimising the negative impact of the environment.
- Road infrastructure eco-innovation in areas such as life cycle assessment (LCA), recycling and waste management, and eco-labels for road products and infrastructure.

Selected projects which would address development and deployment of pavement assessment techniques related to moisture in pavements in the context of flooding and/or performance of Warm Mix Asphalt should capitalise on the existing experience available in the USA. It is expected that the US Department of Transportation will fund US projects on these topics and EU selected projects addressing these topics are expected to cooperate closely with the relevant US funded projects. Part of the budget of the EU funded projects should be set aside for associated coordination activities⁴⁰.

³⁹ <http://tyrosafe.fehrl.org/>

⁴⁰ <http://www.fhwa.dot.gov/research/partnership/eu-collaboration/>

Expected impact:

- Contribute to the objectives of the strategy for a greener, smarter, healthier and more resilient European transport network as set out in the EU Transport White Paper: Roadmap to a Single European Transport Area.
- Products and services that bring about considerable cost-reductions for road authorities and industries and ensuring a wide-European application.
- Guidelines and recommendations for the application and adoption of cost-effective innovation in the road infrastructure sector.
- Standards for the determination of road infrastructure influence on important vehicle performance characteristics (such as safety, fuel consumption and noise).
- Supporting the extension of EU transport and infrastructure policy to our immediate neighbours, to deliver improved infrastructure connections and closer market integration.
- The project is expected to identify possible follow-up actions to be supported through other sources of funding, thus widening opportunities for future deployment.

CROSS-CUTTING ACTIVITIES FOR IMPLEMENTING THE SUB-THEME PROGRAMME

Cross-cutting activities in the Sustainable Surface Transport Work Programme 2013 support the achievement of modal or cross-modal actions which help meeting the three socio-economic Challenges.

SST.2013.6-1. Strengthening the research and innovation strategies of the transport industries in Europe

Level 1 - CSA-SA - Call: FP7-SST-2013-RTD-1

Content and scope: The objective of this action is to strengthening the effectiveness of research and innovation capacities of the transport industries in Europe through improved cooperation between stakeholders, including decision-makers, and enhanced definition of strategic research and innovation needs. The action will assist the transport-related European technology platforms (ETP), the European Commission (EC) and Member States and Associated States (MS/AS) in defining research needs for their strategies and programmes in order to realise the objectives of the Europe-2020 strategy and further on the vision of the White Paper 2011 for a competitive and resource-efficient future transport system.

The action should undertake where appropriate the following activities:

- Updating of research agendas and roadmaps. This includes multi-modal research and innovation areas, which will be elaborated in cooperation with other transport modes.
- The establishment of thematic technological groups on the most relevant technologies to ensure innovative advances by pooling together leading European experts in selected fields, in particular those involved in EU and national research projects and programmes.
- Monitoring of transport research projects from relevant programmes (such as FP7, ENT, JU, etc.), and organisation of workshops to foster innovation aspects.
- Defining implementation plans, including innovation roadmaps and business implementation, based on the research agendas and roadmaps and on the monitoring of

the existing programmes (starting from FP6); this would be an input for the EC and MS/AS.

- Developing links and coordination strategies between the transport-related ETPs and technology platforms existing at national level in MS/AS, in order to avoid duplication of efforts.
- Increasing visibility of research and innovation activities, and contributing to the dissemination of results, through large conferences, thematic events, show cases, databases, website support, newsletters and other publications. Coordination with other large transport events, such as TRA, and cooperation with the Transport Research Knowledge Centre and relevant ERA-NETs need to be ensured.

Three support actions are expected focusing on road, rail and waterborne transport, respectively. Strong and focused consortia must be made-up of leading European experts for transport technologies from both industry and research providers. The implementation of this action requires close collaboration with the ETPs dealing with transport research and innovation (particularly with ERTRAC, ERRAC and Waterborne TP), as well as with other related initiatives and entities. Cooperation with EU services will be an essential element in this support action.

For waterborne transport, dedicated resources and a specific work package should aim to cluster on-going and recently concluded e-Maritime related projects. The purpose is to consolidate and align their developments and support the definition of an EU e-Maritime Framework that will ensure the interoperability of new information systems services for maritime transport and facilitate their take-up in the marketplace.

Note: The project must not subsidise any direct or indirect costs (e.g. secretariat) of the ETP organisations. In kind contributions from additional stakeholders are welcome.

Expected impact: Projects will bring together the leading European stakeholders in transport research to monitor projects, develop roadmaps, and support their implementation. They will contribute to an optimisation of research and innovation strategies, to the improvement of communication, dissemination and use of results as well as to the definition of relevant transport policies.

SST.2013.6-2. Towards a competitive and resource efficient port transport system

CP/CSA-CA - Call: FP7-TRANSPORT-2013-MOVE-1

Content and scope: The objectives of the action are to facilitate ports (maritime or inland waterway) to efficiently handle the increasing freight volumes; to enable seamless logistics chains; to review the restrictions on provisions for port services; to enhance the transparency on ports' financing, highlighting the destination of public funding to the different port activities with a view to avoid any distortion of competition; and to "establish a mutually recognisable framework on the training of port workers in different fields of port activities"⁴¹. The same objectives are at the forefront of the EU transport policy actions⁴².

⁴¹ See the 'Social Agenda for maritime transport' of the 2011 White Paper on Transport policy.

⁴² The 2011 White Paper on Transport policy identifies the need for a strong and highly specialised labour force to tackle the expected growth and change of job profiles in ports.

This topic is aiming to address two particular challenges through two distinct projects. The first focuses on significant differences in current practice in collecting and interpreting ports data that restrict the ability to monitor the evolution, developments and needs of the EU port system. The second is examining the tremendous impacts of innovation⁴³ dynamics as they become critical for the sustainable development of EU ports. Technological changes and market pressures will drive requirements for mastering innovative port operations and generating the necessary human resources, i.e. people with the right skills, training and qualifications to understand, master and exploit all the advantages provided by the new technologies.

A collaborative project is expected to develop a ports observatory with a set of indicators measuring EU ports performance, activities and developments. The results of the PPRISM project and other relevant work⁴⁴, including failures from past projects, should be taken into account. Indicators should initially be identified across five different categories: 1) market trends and structure; 2) logistic chain and operational performance; 3) environment; 4) governance; and 5) socio-economic issues. Starting from a limited set, focussing on the five different categories, forward-thinking should seek possible extensions and elaborations of the set of indicators. This collaborative action should go beyond the port authorities and develop an approach to obtain data from the whole port community: port authorities, terminal operators, shipping lines calling to the different ports, etc. At the same time, it should ensure that inland ports are also covered by the observatory. The implementation will demonstrate that it satisfies stakeholder confidentiality concerns in the management of data. The indicators will be weighted and aggregated in order to have a comprehensive and meaningful output. A balanced representation of ports and port actors across the EU, and possibly the neighbouring countries, will be demonstrated and an easy to use interface for the collection of the data implemented.

To meet the second challenge another project will address sectorial changes and human issues, specifically needed skills, as a component of wider efforts to make EU ports more competitive and resource efficient. The competitiveness of European ports will depend on the ability to innovate and to apply new technologies in an effective and efficient way. The human element is one of the key factors of success. Port industries employees should not only be able to use new systems but to guide innovation. Core elements of the project then should consider processes of terminals and ports, new techniques and technology changes, impacts on performance and evaluate staff development requirements to ensure safe and efficient operations but also to support career development and knowledge building. Relevant results of EU projects should be considered. The action should ensure the active participation of the key stakeholders and facilitate an effective, broad and open dialogue between the social partners within the port sector for pan-European solutions.

Expected impact:

- The first action should produce a knowledge and management tool for monitoring the efficiency and performance of sea and inland ports. It will allow a comprehensive view on port activities, developments and performance and, at the same time, allow for individual ports to compare their activities and operations with the EU average and with

⁴³ Highly sophisticated port handling equipment technologies and innovations in port processes and logistics.

⁴⁴ The EUROSTAT Transport Working Groups, the ECOPorts initiative, individual reporting by ports, the Germanischer Lloyd 'Container Terminal Quality Indicator Standard', the experiences of the shipping-KPI project and others.

ports in other important regions like Asia and the Americas. The results should include appropriate mechanisms to collect, manage and distribute the data on a long term and to show trends over a substantial timeline and a business case to ensure sustainable continuity. For this activity, collaboration with Mediterranean Partner Countries would be welcome.

- The second action should support both the implementation of the International Labour Organization 'Guidelines for Training of Workers in the Port Sector' and the objective of the 'Social Agenda for maritime transport' for the establishment of a mutually recognisable framework on the training of port workers in different fields of port activities. It should identify anticipated human resource demand profiles, skill and training needs for EU ports in the 2030 horizon. It should facilitate consensus building on the next steps that need to be made in accomplishing the objectives of a sustainable and efficient EU port system.

SST.2013.6-3. Organisation of Transport Research Awards for the Transport Research Arena (TRA) conference

Level 2 - CSA-SA - Call: FP7-SST-2013-RTD-1

Content and scope: The objective of this action is to organise two competitions for transport research awards to be announced at the TRA conference in 2014:

- A research student competition with the goal of stimulating the interest among young researchers/students in the field of sustainable surface transport.
- A competition for senior researchers in the field of innovative surface transport concepts based on results only from EU-funded projects.

Both competitions will cover all surface transport modes (road, rail and waterborne) and cross-cutting issues in line with the EC policy objectives for smart, green and integrated transport. The organisation of these awards should ensure high-quality competition and very good media coverage before, during and after the TRA conference.

Expected impact:

- Stimulate young researchers/students to submit their research work to the competition.
- Encourage partners from EU-funded projects to further develop innovative ideas from their projects.
- Directly support the TRA conference as a successful, high quality scientific event which is considered as the first Transport research conference in Europe.
- Efficiently disseminate knowledge and results of European and National research projects in the area of Sustainable Surface Transport and thus improve the coordination of research, technology development and innovation in the Surface Transport sector in Europe.

THE 'EUROPEAN GREEN CARS INITIATIVE'

The 'European Green Cars Initiative' includes three major research and development areas within its RTD pillar: 1) development of electric vehicles for road transport; 2) research for heavy duty vehicles for medium and long distance road transport; and 3) logistics and modality.

GC.SST.2013-1. Feasibility analysis and technological development of on-road charging for long term electric vehicle range extension

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Contents and scope: Wide-scale adoption of pure Electric Vehicles (EVs) requires advanced charging solutions which provide a user experience similar to today's cars, particularly in terms of range. In the long term, electric vehicles might be able to collect energy from the road, be it in a conductive or contactless fashion. Compared to the current paradigm of larger installed storage capacity or fast charge or switchable batteries, advanced charging solutions might improve driving range and battery lifetime of the full electric vehicle (FEV) as well as its energy efficiency and price, given the need for a smaller battery.

Research will address the following aspects at the system level:

- Analysis of the feasibility of the possible technological options of on-road charging (including transferring solutions currently proposed for stationary or rail mobile applications to light duty vehicles and possible extension to buses and medium trucks for urban applications) and their testing and comparison in terms of the main parameters such as cost, transferable power and efficiency, and infrastructure requirements.
- The impact on the vehicle in terms of architecture and capacity of the on-board energy storage systems should be assessed.
- The ergonomics of driving while in charging mode and potential links with (semi) automated driving benefiting from the presence of the charging line; the potential of related technologies like platooning should be explored.
- Development and technological demonstration of one selected charging option in terms of the required on-board and on-infrastructure energy transfer technology, maximizing efficiency and instantaneous energy transfer rates.
- A comprehensive assessment of impacts of the selected on-road charging option related to:
 - Economics (capital and operating cost impacts on the vehicle and on the infrastructure) including business cases for the gradual introduction in urban and extra-urban roads
 - The distribution network and the electricity generation. High power connections will be required for on road charging and some of the power use may be shifted to peak hours. The assessment should include opportunities for renewable energy use in different stages of deployment.
 - Assessment of pavement construction and maintenance requirements, including interaction with other technological infrastructure in or below it. Assessment of impacts on road infrastructure should be part of the demonstration of the charging technology.
 - Environment, including a life cycle assessment of environmental impacts, risks and benefits of the entire proposed solution for continuous charging of the vehicle, including the vehicles, the infrastructure and the energy production and distribution, comparing it with the current reference cases of slow and fast charging FEVs and range extended/plug in hybrids.
 - Safety (including EMC) and health impacts on electronic systems, vehicle occupants and on persons and animals close to the infrastructure.
- Assessment of the needed ICT solutions to support the driver and charging energy costs, including data security and privacy issues.
- Measures enabling the staged deployment of charging infrastructure and the required harmonisation and standardisation

Strong links should be established with running EU and national funded projects in the same area, particularly as far as charging technologies are concerned. Furthermore, the project is expected to establish cooperation and to coordinate with relevant projects under the NMP, Environment, ICT and Energy programme to jointly support the 'European Green Cars Initiative'. The participation of SMEs is particularly encouraged.

The projects financed under this topic will contribute to the objectives of the Smart Cities and Communities Initiative.

Expected impact:

- A global feasibility and demonstration study of the on-road charging concept capable of orienting future activities while highlighting the relevant social, environmental and economic issues and any technological gaps.
- Provide evidence on environmental, economic and energy system benefits of advanced on-road charging options.
- Advanced steps for bridging technological gaps and bringing about a rational solution for both the grid and the road infrastructure.

GC.SST.2013-2. Next generation electric motors

Level 2 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: The energy efficiency and affordability of pure electric vehicles can be improved by next generation of electric motors. Improved materials or substitutes could deliver higher and tailored output while reducing weight and volume. The scarcity and the recyclability of such materials should also be addressed considering the mass introduction of next generation electric vehicles.

Research will focus on:

- Weight reduction and power density increase.
- Increased efficiency, including smart packaging of power electronics and integrated thermal management.
- Optimised design and processes for manufacturing and dismantling.
- Novel or substantially improved materials for permanent magnets replacing or greatly reducing rare earths content, or innovative magnet-free designs.

Expected impact:

- Increased energy efficiency over a wide range of EV operating conditions.
- Reducing cost towards mass use in next generation electric vehicles.

GC.SST.2013-3. Future light urban electric vehicles

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: The objective is to close the gap between bikes/mopeds and cars by developing light, affordable, safe, ergonomic and energy efficient electric vehicles (at least two seats and three wheels) meeting customer expectations in all weather conditions. The focus is on passenger applications (although freight delivery derivatives can be expected) and on the global vehicle architecture and design.

Research under this topic will use technologies and components which are either off-the-shelf or covered in previous calls (no specific technology development of components) to address collectively the following aspects:

- Optimised weight through innovative materials and system integration.
- Safe and integrated chassis and body shell design to achieve similar occupant safety level than in normal passenger cars despite worse conditions by using optimised crash detection mechanisms and actuators (restraints and structures); high compatibility design.
- Extremely low energy consumption with purely electrical braking providing enhanced recuperation capability with respect to the state of the art and advanced stability systems. This research should also consider the possible failure modes and give attention to any regulatory requirements for such systems.
- Assembly line capable designs based on low energy consuming manufacturing processes.
- New business approaches, based on reasonably low budgets and leading to novel supply chains

Expected impact: Vehicle prototypes will demonstrate the following performance:

- 40-80 Wh/km energy consumption in real urban driving corresponding to the given weight bracket.
- At least 150 km pure electric range in real urban driving including the use of comfort accessories.
- Compelling acceleration (0 to 100 km/h in 10 s).
- Best in class protection for the driver and passenger and for pedestrians in EURONCAP crash tests, with highly compatible design.

GC.SST.2013-4. Demonstration of electric buses as urban public transport

CP - Call: FP7-TRANSPORT-2013-MOVE-1

Contents and scope: The White Paper ‘Roadmap to a single European transport area’ calls for a transition from a car based personal mobility to a public transport based mobility. Public transport plays also an important role in mitigating the negative effects of transport in urban areas such as congestion, greenhouse gases and pollutants emissions. Clean, energy efficient and silent buses will contribute to meet these objectives. A large demonstration project will facilitate the market take up of electric buses in Europe. The fleets of urban buses will include the main types of electrification technologies dealing with different scenarios of interaction with the electricity grid. The proposal time frame should be designed to take on board latest development in EU or national programs and latest available innovative industrial technologies for all vehicle categories considered. Existing local or regional demo projects and new projects could be coordinated in this demonstration project.

The activities to be carried out should include:

- Demonstration of the use of electricity as energy vector for urban buses in a wide range of real-life operating conditions. The project could demonstrate innovative electric buses with different types of electrical power train systems covering plug in hybrid to full electric technologies. Fuel cells buses should be excluded from the proposal. Focus should be on vehicles with interaction with the grids. The demonstration sites should provide various climatic and geographical conditions. Coordination of existing local, regional or national demonstration programs is an asset.
- Assessment of the infrastructure optimisation and bus-to-grid interaction scenarios.

- Development of standards, investigation of safety issues, and technology validation for performance, durability and costs.
- Assessment of the impact on energy and environment, including a well-to-wheels analysis.
- Communication, dissemination of information, and education.

The project should have a predominant demonstration component. The marginal cost associated with the innovation element compared to state-of-the-art vehicles will be considered as eligible cost. A typical consortium could include cities or regional authorities, fleet operators, vehicle and equipment manufacturers, utilities, research centres and universities.

This activity should assimilate the results of previous FP7 research projects on buses and establish links with the projects under topic SST.2012.3.2-1 'Coordinating innovation for efficient bus systems in the urban environment', topic GC-SST.2012.1-7 'Demonstration of urban freight electric vehicles for clean city logistics', and FP7 project 'Green emotion'.

The projects financed under this topic will contribute to the objectives of the Smart Cities and Communities Initiative.

Expected impact: This project should clarify the viability of the different types of electrical buses for immediate market introduction within urban areas. The expected impact of this project is an acceleration of the market roll-out of electric buses in order to meet EU policy objectives. The project should facilitate pre-commercial procurement and foster innovation in the public sector. The project should also help to clarify possible support for further deployment of electric buses in European cities through European Investment Bank instruments.

GC.SST.2013-5. Configurable and adaptable truck

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Contents and scope: Today trucks are designed and optimised towards a limited variance set of usage and for maximum payload. In the future there will be an increasing need for optimised load efficiency for each mission of a truck, and for optimising the freight carried on a finite length of road. The objective of research is to develop innovation solutions for the truck and load carrier design to have an integrated approach on configuration and adaptation of the vehicle concepts. Both the design phase (e.g. new tractor-trailer architecture) and the operation phase should be considered. A key aspect in the design phase is to have a modular drive line for rightsizing the vehicle combination with respect to the transport assignment while keeping vehicle performance (e.g. stability). In the operation phase, the vehicle combination should be adapted to the actual driving environment (i.e. traffic situation, topology, and payload). The implications of vehicle and conveying concepts for the infrastructure should also be considered. The project should also investigate legal constraints and harmonisation issues across the EU, e.g. engine certification, vehicle combination dimensions, etc. and identify possible deployment scenarios.

The following issues should be addressed by research:

- Optimised trucks design for transport mission.
- Configurable truck (tractor and trailer) and load carrier concepts.
- Energy tailored driveline, with a modular approach for rightsizing.

- Total truck – trailer architecture including modular powertrain.
- Distributed driveline including high level of hybridisation.
- Consideration of the infrastructure (pavement and bridge) needs: including methods to overcome any negative consequences from future types of trucks which may result from different distributions of axle loading (distributed driveline) or overall weights and dimensions.

The project should include the development of a demonstrator of complete vehicle combination and requirements on modular tractor and trailer design.

Expected impact: Viable concepts for better matching and combination of truck and load carrier to different types of transport assignments together with the infrastructure construction and maintenance aspects that will lead to an improved load efficiency both from an energy (estimated to 25% less energy/t.km, drag reduction, driveline and transport mission rightsizing,) and infrastructure service usage point of view.

GC.SST.2013-6. High efficiency energy conversion for future heavy duty transport

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: The aim of research is to develop innovative complete high efficient energy conversion concepts for heavy duty trucks.

Research may include:

- innovative power converters (with a level of demonstration, and therefore funding, coherent with the level of maturity of the concept);
- engine downsizing concepts, e.g. dynamic cylinder deactivation;
- refined combined cycle systems, with e.g. heat, steam or fuel cell systems;
- drive train concepts reducing the transient environment for the engine, e.g. by dynamic energy storage offering optimisation potential of the engine; etc.

These converters must be designed to be operated in combinations with highly efficient integrated after-treatment solutions. A new generation of total driveline control architectures should be developed which utilise the potential of the new energy converter concept in an optimal combination with truck energy usage and energy recovery systems on-board.

Expected impact: Demonstration of new innovative energy conversion concepts which reach a system efficiency well above 50% at acceptable costs with the capability of achieving Euro VI emission levels in real life by PEMS⁴⁵ measurements with a 1.2 multiplier.

GC.SST.2013-7. Technical and operational connectivity in intermodal freight transport

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: Ports, freight terminals and the transport industry are confronted with

- ever increasing volumes to handle (continuous volume growth over the years as well as increased vessel sizes);

⁴⁵ Portable Emissions Measurement Systems

- new logistic concepts applied by shippers such as co-modality and synchro-modality, the latter offering companies the ability to time and again select the most appropriate mode of transport for a particular moment and circumstances;
- the need for innovative transshipment technologies allowing cost efficient integration of small and voluminous container flows and the sharing of transport volumes which may e.g. require stop and go operations in addition to point to point shuttle services;
- the fast growing development of e-freight applications and networks for a secure, reliable and efficient platform for digital information exchange for global trade and logistics; and
- the growing development of port - hinterland networks.

The objective of this topic is to increase the individual and co-operative performance quality and throughput of ports and terminals through the development of innovative technologies, infrastructures and e-freight solutions. Research under this topic will address the following aspects:

- Next generation of environmental friendly safe and efficient “Automated Guided Vehicles” for the transport of goods within ports/terminals or beyond fenced spaces, i.e. between ports/terminals, and supportive infrastructure.
- New transshipment technologies, new management and software tools, including information systems to improve visibility and access to data in order to promote the generation and use of multimodal routes for goods transport.
- Low-cost innovative connectivity solutions based on existing, freely available components, which may include upload and download facilities, document sharing facilities with access authorisation mechanisms, electronic document readers, a basic data model that is in line with existing international standards, and dashboard functionality. Functional requirements and main components for modular connectivity solutions in international trade should be addressed.

Cooperation with Mediterranean partner countries is encouraged.

Expected impact:

- Efficient and safe port and terminal operations.
- Efficient, safe low environment impact use of transport means within and between ports and terminals.
- Contribution to the open up of e-freight developments to a wider community, notably SMEs and link them up with networks that are being developed predominantly by big companies.
- Development of easy to use and affordable software solutions and demonstrate connectivity solutions (in particular for SMEs in the transport sector) in different trade lanes, within the European Union, and between European Union and third countries, for different purposes, with special attention for the ease of use, low entry barrier, possibilities for quick connect and disconnect, and possible business models.
- Assessment of the benefit for international trade of a general roll out of this type of connectivity solution.

"THE OCEAN OF TOMORROW – 2013: JOINING RESEARCH FORCES TO MEET CHALLENGES IN OCEAN MANAGEMENT"

Fostering research and innovation on marine technologies

Aims of the call

The EU Strategy for Marine and Maritime Research⁴⁶ supports the EU integrated maritime policy's objective of a thriving and sustainable maritime economy. It is a key component in reconciling the growth of maritime activities with environmental sustainability and thus it contributes to the 'Europe 2020' goal of smart, inclusive and sustainable growth for Europe. In this context, "The Ocean of Tomorrow" calls for proposals aim to foster multidisciplinary approaches and cross-fertilisation between various scientific disciplines and economic sectors on key cross-cutting marine and maritime challenges.

"The Ocean of Tomorrow 2013" third cross-thematic call will focus on marine technologies. The development of competitive and innovative marine technologies is necessary to assess and monitor the good environmental status of the seas, monitor current and new activities and contribute to their sustainable operation. "The Ocean of Tomorrow 2013" call will therefore aim at pooling the efforts of stakeholders from various disciplines and sectors in order to develop innovative marine technologies for a wide range of applications.

Three key areas will be tackled: sensing technologies that are necessary to improve reliable measurements of key parameters in the sea, new materials that can avoid bio-fouling on mobile and stationary structures, and innovative transport and deployment systems for the offshore energy sector.

The call will be implemented jointly between Theme 2 "Food, Agriculture and Fisheries, and Biotechnology" (FAFB), Theme 4 "Nanosciences, Nanotechnologies, Materials and new Production Technologies" (NMP); Theme 5 "Energy", Theme 6 "Environment (including climate change)" and Theme 7 "Transport (including Aeronautics)".

"The Ocean of Tomorrow 2013" call fiche with all relevant information can be found in the Work programme of Theme 2 "Food, Agriculture, Fisheries and Biotechnology" (FAFB), as well as on the Participant Portal under the call page FP7-OCEAN-2013.

OCEAN 2013.1. Biosensors for real time monitoring of biohazard and man-made chemical contaminants in the marine environment

Call: FP7-OCEAN-2013

Due to growing concerns about the health of the oceans and their capacity to continue to provide resources, goods and services as well as associated risks to the human health, there is an increasing demand for real-time monitoring of the environmental status of marine water quality and the provision of early warning systems. Real-time in situ monitoring of marine chemical contaminants (including emerging pollutants, biohazards e.g. algal toxins) is of

⁴⁶ COM (2008) 534 final of 3.9.2008 - Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: "A European Strategy for Marine and Maritime Research: A coherent European Research Area framework in support of a sustainable use of oceans and seas".

utmost importance for the sustainable management and exploitation of the seas and their resources.

Technology wise, marine biosensors have the potential to offer unique features for highly specific and precise measurements, including under multi-stressor conditions, by combining technological elements (including nanotechnologies) and bio-receptors in a single measurement device. Thus they could open new avenues to respond to the growing need for accurate real time monitoring of the quality of sea water and marine ecosystems to support relevant EU legislations such as the Marine Strategy Framework Directive (MSFD)⁴⁷.

Based on most recent knowledge on genomics and physiology as well as on materials, nanotechnology, information technologies and relevant existing detection/monitoring technologies, the research under this topic should aim at developing innovative real-time, in situ biosensors, taking advantage of nanotechnology when applicable. These sensors should target the detection and monitoring of high impact and presently difficult to measure emerging pollutants and other substances, such as algal toxins and their producers, synthetic organics, herbicides/pesticides and persistent organic pollutants (POP), including polycyclic aromatic hydrocarbons (PAH) and should enable early diagnosis of deterioration of the environmental status of the marine waters in multi-stressor conditions.

The proposals should include a test phase to demonstrate the potential of these biosensor(s) for in situ environmental and/or aquaculture related applications. Measurement devices should show ability to compete with/complement non real time alternatives and provide faster, less expensive, and less time-consuming measurements than the currently available instrumental analytical methods. A proof of concept in terms of product and/or process should be delivered within the project demonstrating industrial manufacturability.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

Funding scheme: Collaborative project

Several projects may be funded within the total budget of the topic (EUR 15 000 000).

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 25% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

⁴⁷ Directive 2008/56/EC of the European Parliament and of the Council establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), OJ L 164 of 25 June 2008.

Expected impact: New biosensors in the field of marine environmental monitoring will:

- Enable early detection and more effective monitoring of the marine environment and its status and implementation of appropriate management actions in line with the Marine Strategy Framework Directive (MSFD).
- Improve sustainable management and exploitation of marine resources (such as fisheries and aquaculture) in particular the monitoring of quality of shellfish waters and minimise risks to human health.
- Provide competitive advantage and leadership to European industry, for example within the fields of biotechnology, sensor development, diagnostic technologies and nanotechnology.

OCEAN 2013.2. Innovative multifunctional sensors for in-situ monitoring of marine environment and related maritime activities

Call: FP7-OCEAN-2013

There is an urgent need to improve the in-situ component of the ocean observing systems to achieve an appropriate and comprehensive understanding of the functioning of the marine environment at different geographic, temporal scales and the monitoring of marine and maritime activities to ensure their sustainable development. As commercially available sensors tend to be too large, expensive, and power-hungry for widespread use, reducing the cost for acquisition of data is a key priority in order to implement EU legislations such as the Marine Strategy Framework Directive (MSFD), the Common Fisheries Policy CFP), support international initiatives such as the Global Ocean Observing System (GOOS) and the Global Earth Observation System of System (GEOSS).

In this context the topic seeks to develop robust, easily usable across multiples platforms, cost effective multifunctional sensors and their packages that provide reliable in-situ measurements of key parameters. Research and demonstration activities under this topic shall address in a comprehensive manner all the following aspects:

- 1) Developing cost-effective sensors suitable for large-scale production, taking advantage of "new generation" technologies such as within the fields of miniaturisation, communication, positioning systems, disposable technologies, and IT tools, software, energy storage and usage.
- 2) Sensors should be compact, autonomous multifunctional integrated packages that could be deployed using free floating devices or, buoys, platforms, or ships of opportunities including fishing vessels. The sensors must be developed as precompetitive prototypes and field tested in close cooperation with stakeholders such as sensor designers, SMEs, managers of monitoring/observing systems, marine industry e.g. fishermen and end-users. An essential part of this topic will be to ensure technology transfer through an integrated approach, bridging between laboratory testing and commercially viable product.
- 3) Addressing data flow issues, including data acquisition, access and retrieval, storage, transmission, standardisation, and pre-processing. The projects should take advantage of the latest web enablement technology for setting up sensors' networks suitable for open access and data sharing.
- 4) Making the sensors fully interoperable with existing observing systems and compatible with standard requirement such as the EU Fisheries Data Collection Framework, the Marine

Strategy Framework Directive, the INSPIRE directive⁴⁸, the GMES and GOOS/GEOS initiatives.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

Funding scheme: Collaborative project

Several projects may be funded within the total budget of the topic (EUR 15 000 000).

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 30% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected impact: The projects will:

- Provide a large increase in the temporal and geographic coverage from in-situ marine sensors to enhance the European contribution to Global Monitoring of the Oceans.
- Increase availability of standardised in-situ data that is suitable for integration within key marine observation, modelling and monitoring systems and reduce ocean modelling uncertainty.
- Reduce cost of data collection system in support of fisheries management.
- Advance competitiveness for European Industry and particularly SMEs within the Marine sensing sector.
- Enable better cooperation between key sectors (Manufacturing Industry, ICT, Maritime Industry, Marine Science, Fisheries, etc.).
- Support implementation of European Maritime Policies (MSFD, CFP, IMP, etc.).
- Promote new discoveries leading to better understanding of the seas.

OCEAN 2013.3. Innovative antifouling materials for maritime applications

Call: FP7-OCEAN-2013

Biofouling is a major concern for mobile (e.g. ships) and stationary (e.g. aquaculture cages or offshore power generation systems) maritime structures, sensors and equipments. It negatively affects marine and maritime activities by creating a need for regular maintenance, which is costly, might disrupt operations and is potentially polluting. With the purpose of avoiding toxic biocides and heavy metals used in antifouling coatings, novel alternative cost-efficient and environmentally friendly approaches are needed.

⁴⁸ Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE).

The proposals under this topic should focus on developing new, well beyond the state of the art, antifouling materials and should address in an integrative way mobile and stationary maritime applications.

On the basis of a thorough analysis of the state of the art, research could draw on the whole range of antifouling materials e.g. foul release approach, biomimetics, marine biotechnology based coatings, polymers, etc. The proposals should include benchmarking of existing materials, technologies and on-going research. In this sense environmental and economic factors, as well as performance, must be duly considered.

Improvement in the understanding of marine biofouling processes, including their relation with biocorrosion, with respect of the developed materials should be an integral part of the proposals. For the resolution of the technological bottlenecks impeding the achievement of well performing final materials and products, applicants are welcome to investigate and exploit the potential offered by converging technologies such as e.g. materials science and engineering, maritime technology, nanotechnology and biotechnology.

The proposals should include relevant field testing for all the selected applications. Development, improvement and/or standardisation of relevant protocols should be included. Proof of concept in terms of product and/or process should be delivered within the project, excluding commercially usable prototypes (in compliance with European Commission Communication 2006/C323/01), but convincingly proving scalability towards industrial needs.

In the case of marine biotechnology based approaches the issues of supply and the need for the biobased active antifouling compounds to be produced in bulk, as required for final commercial production should be given due consideration.

The proposals should follow a life cycle approach for the new materials and their selected applications also taking into account issues of cost efficiency, effective life span, production, handling, maintenance, environmental impact, ecotoxicological profile and end of life. The proposals should include assessment of the environmental, health and toxicological effects according to REACH⁴⁹, OECD Guidelines for the Testing of Chemicals and/or relevant international standards.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

⁴⁹ Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

Funding scheme: Collaborative project

Several projects may be funded within the total budget of the topic (EUR 15 000 000).

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 8 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 25% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected impacts: The projects will:

- Increase efficiency and competitiveness of maritime activities based on mobile and/or stationary maritime structures (transport, aquaculture, fisheries, marine energy) by reducing operation and life-cycle-costs, negative impacts on the marine environment and, in particular, for the transport sector, CO₂ emissions.
- Enhance competitiveness and sustainability of the European biotechnology, and/or materials related industry.
- Better understanding/assessment the scope of existing antifouling materials and technologies.
- Contribute to the implementation of EU policies, Environment policy (e.g. the Marine Strategy Framework Directive, REACH), Transport policy (Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system) as well as industrial and innovation policy, such as the EU Strategy for Key Enabling Technologies and the Lead Market Initiative on Bio-based products.

OCEAN 2013.4. Innovative transport and deployment systems for the offshore wind energy sector

Call: FP7-OCEAN-2013

In its Communication ‘Offshore Wind Energy: Action needed to deliver on the Energy Policy Objectives for 2020 and beyond’, the Commission underlines that the exploitable potential of offshore wind by 2020 is likely to be 30-40 GW, and in the 2030 time horizon it could be up to 150 GW.

In 2007, the Energy Wind Association assessed that achieving 40 GW by 2020 will mean that 7,800 turbines of 5 MW need to be built over the next 13 years. Those turbines have to be assembled, transported and installed on sites.

The Strategic Energy Technology Plan (SET-Plan) European Wind Initiative identifies transport and logistic issues as key elements for the deployment and maintenance of offshore wind farms. The TP Wind Strategic Research Agenda also points to research needs both in relation to the cost-effective installation, maintenance, operation and decommissioning of large offshore wind farms as well as to transport, logistics and equipment needs.

In its Communication on Strategic goals and recommendations for the EU's maritime transport policy until 2018, the Commission stresses that maritime transport is an important instrument of the European energy policy. Amongst others offshore servicing vessels are considered as increasingly important aspect for ensuring the well functioning of the energy market.

Research activities under this topic shall address the following aspects:

- Development of innovative and cost-effective deployment strategies for large-scale turbines, including building and testing onshore.
- Elaboration of optimal logistical processes and on-land transport links for large offshore structures.
- Design of novel vessel types and equipment for installation, maintenance and decommissioning and validation at reduced scale.
- Development of safety procedures for installation, operation and maintenance activities, regarding both offshore wind structures and the vessels.
- Improved operations and maintenance including the enhanced role of remote condition monitoring and systems with reduced human intervention.
- Development of new business models at European level for large offshore systems based on integrated life-cycle approaches.
- Development of methods and tools to assess the field performance of offshore wind farms servicing vessels and for optimised service activities in terms of lead time and energy usage.

Proposals are expected to include validation activities at reduced but industrially relevant scale using testing models and where possible tests at real scale using existing infrastructure and equipment, adapting those to validate models and management tools. Tests should also address extreme conditions. The proposal should cover both ground based and floating wind parks.

The multi-disciplinary approach of the research undertaken is essential to address the topic. Knowledge exchange with oil/gas and maritime sectors is expected. These aspects will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

In the framework of the SET-Plan European Industrial Initiatives, a specific monitoring and knowledge sharing mechanism will be established under the auspices of the Commission and the selected project will be expected to participate.

Funding Scheme: Collaborative project

Up to one project may be funded.

Additional eligibility criteria:

The requested European Union contribution shall not exceed EUR 10 000 000 per proposal.

Expected impact: The project will:

- Contribute to the implementation of the roadmap activity of the European Wind Initiative aiming at supporting offshore take-off in the medium-term.
- Contribute to the development of new niche markets for the European shipbuilding and shipping industries thereby contributing to competitiveness of the sector and to the creation of new jobs.

7.3. HORIZONTAL ACTIVITIES FOR IMPLEMENTING THE TRANSPORT PROGRAMME

I.3. CONTEXT

Topics addressing all at once the three socio-economic challenges: eco-innovation; safe and seamless mobility; and competitiveness and growth through innovation (see section I.0) have been included in the AAT and SST ‘cross-cutting activities’ chapters of this 2013 Transport work programme (see table of contents).

In addition to these topics of cross-cutting character, the Transport (including Aeronautics) theme aims to support horizontal activities that address “cross-modal” issues common to the two Transport sub-themes AAT and SST, and/or that exploit the synergies between transport modes. These activities will make a contribution to the strategic research and innovation priorities for 2013 and help also meeting the socio-economic challenges.

In previous years, the horizontal activities were included in a separate call (TPT call). For the sake of simplification, in WP 2013 these activities will be included in call FP7-SST-2013-RTD-1.

II.3. CONTENT

TPT.2013-1. Technology transfer in the area of Transport

CP-FP - Call: FP7-SST-2013-RTD-1

Content and scope: Technology transfer is a very efficient way to foster innovation and market take-up. In the transport sector this is particularly relevant since some trends towards the use of the same materials, processes or solutions in different modes and sectors are evident, with a certain time shift due to cost or maturity issues.

The aim of this topic is to develop and implement concepts of technology transfer or cross fertilisation of technical solutions between transport modes or sectors in areas such as sustainable and light materials and their processing, human factors, lean manufacturing, passenger comfort and safety, energy efficient components, etc.

This topic accepts bottom-up proposals in which a potential user or group of users in any transport sector develops in cooperation with partners in another transport sector/application the use of a technology for their intended application. Special attention should be given to possibilities of technology transfer from aeronautics to other transport modes in the areas of new and intelligent materials, composites, sensor systems, etc. Proposals should satisfy important needs for one or more surface transport SMEs and help widening the participation of weaker players of enlarged Europe in innovation.

Expected impact: It is expected an increased efficiency of research and innovation efforts by enhancing co-operation and sharing of technology between surface transport modes and aeronautics. In particular, SMEs are expected to benefit from this approach, since most of them have difficulties in developing technologies in-house but are normally very good at applying or adapting existing technologies.

TPT.2013-2. Mapping regional capacities in transport research and innovation
CSA-SA - Call: FP7-SST-2013-RTD-1

Content and scope: Regions are increasingly recognised as important players in the EU's research and development landscape. They provide the real space for creative exploration of integration and synergies between various programmes. At the same time, evidence indicates that investment in R&D makes regions more attractive and local businesses more competitive. However, despite the efforts that have been made at various levels, there are still huge differences between European regions, including differences between regions within the same Member State. According to Eurostat figures, only 27 of the 260 regions spend the equivalent of over 3% of their GDP on research and development whilst over 40% of the EU's total R&D expenditure of around EUR 200 billion is generated in these regions. In seeking to stimulate regional potential for research and innovation actions will be needed that support the continuing development of Europe's strongest regions and that can release the latent potential existing in less advanced regions. Regional efforts to stimulate research and innovation should play to their strengths and opportunities, as well as tackling identified weaknesses. A solid evidential base is required in order to identify the strengths, weaknesses and opportunities at regional level.

The aim of this exercise is to map the regional capacities in transport research and innovation in order to identify and position evidence, actors and interactions in transport research and innovation, as well as opportunities for follow-up actions to be supported through other sources of funding, thus widening opportunities for future deployment; more concretely:

- The framework within which transport research and innovation takes place (institutional, policy, programmes and financing, skills base, infrastructure, etc.) as well as existing strategies at regional level.
- The actors involved at various levels in regional transport research and innovation, as well as co-operation and collaboration patterns within the region and the linkages out of the regions ("collaborating to compete").
- The main transport research and innovation activities at regional level as well as their impact (for instance on the regional competitiveness), areas of distinct specialisation, and either established or potential areas of excellence.
- The strengths, weaknesses, opportunities and threats at regional level, as well as main drivers and obstacles to innovation.
- To provide concrete recommendations for strengthening the role of transport research and innovation at regional level for example in form of road maps.
- To develop a series of specific, quantitative and qualitative indicators describing the transport research and innovation performance at regional level.

Particular attention should be given to the role and needs of SMEs. Relevant findings from previous projects such as TransNEW, DETRA and MARKET-UP should be taken into consideration.

Expected impact: The action should contribute to:

- gaining a fundamental understanding of the regional transport research and innovation activities and its unique characteristics, assets and shortcomings;
- diagnosing the regional transport research and innovation landscape in a fashion that helps point the way to where comparative and competitive advantages lie; and

- in a further step, helping regions to create a strategy that build upon existing and potential areas of comparative advantage, avoiding fragmentation (i.e. individuals and organisations pursue their own agenda of individual projects disconnected from a broader regional strategy) and insularity (i.e. pursuing old strategies without learning that the rules guiding global competition are changing in a fundamental way), and linking and leveraging the assets in new and different ways.

TPT.2013-3. Ex-post evaluation of the Transport (including Aeronautics) theme of the FP7 'Cooperation' specific programme

CSA-SA - Call: FP7-SST-2013-RTD-1

Content and scope: The objective of the ex-post evaluation will be to assess the overall implementation and management, as well as the achievements and impacts of the transport research co-financed by FP7 with respect to its specific objectives, their economic, social and environmental impacts, the efficiency, effectiveness, relevance of the funding and the sustainability and utility of the different transport research programmes. The evaluation will also give conclusions and recommendations for potential improvements.

The study should allow for:

- Identifying and listing the concrete results of the research funding and assessing positive and negative outcomes (promising technologies, operational services, patents, etc.).
- Quantitative and qualitative evaluation of significant economic, social and environmental impacts, measured via predefined indicators.
- Measuring the added value of EU-scale research funding in transport, with particular focus on excellent science, industrial leadership and societal challenges.
- Comparative analysis of Europe's research funding and scientific, technological and economic performance in transport versus other major economies (e.g. US, other OECD, BRIC, etc.).
- Measuring the relation of the scientific and technological objectives with the achievement of the major EU policies (Europe 2020, Innovation Union and the 'grand challenges', and the White Paper on Transport).

This evaluation should cover all research and innovation programme activities under the Seventh Framework Programme related to the theme 'Transport (including Aeronautics)', with the exception of Galileo and SESAR. The methodology to be applied in this evaluation is to be elaborated by the contractor, who will combine innovative approaches, allowing both qualitative and quantitative assessment. The evaluation will rely on previous assessments such as the 'Interim Evaluation for FP7' and the 'Impact Assessment to Horizon 2020'.

The duration of the support action shall not exceed 12 months.

Expected impact: This support action will evaluate to which extent the FP7 investment in Transport research and innovation has contributed to greener, smarter and more integrated transport systems, to the Europe 2020 goals of smart, sustainable and inclusive growth, to the objectives of the Innovation Union (excellent science, industrial leadership and societal challenges), and to the implementation of the White Paper on Transport.

7.4. GALILEO

I.4. CONTEXT

The European Global Navigation Satellite System, encompasses Galileo and EGNOS, and provides a worldwide positioning and timing infrastructure.

In parallel to the development phase, which is demonstrating the technical feasibility and the European capacity of implementing an independent satellite navigation infrastructure, the deployment of the full Galileo satellite constellation and the associated ground segment started in 2008. The procurement activities include full system validation and are foreseen to lead in 2014 to an operational infrastructure owned by the European Union.

The main objective of the deployment phase is to procure and set up the various elements that constitute the Galileo infrastructure, in particular the completion of the space and ground infrastructures, system support tasks, launch and operation of services, as well as the development of external interfaces for the future service/application systems and test receivers. Beyond manufacturing of equipment, the procurement activities encompass trade-offs and analysis, simulations, testing, demonstration, in-orbit validation, and other activities that increase competencies of European companies in satellite navigation.

According to the European GNSS Regulation⁵⁰, the financial envelope foreseen to implement the above activities (EUR 3.4 billion for EGNOS and Galileo) includes the sum of EUR 400 million made available from the Seventh Framework Programme for the period 2007-2013.

A delegation agreement between the European Commission and the European Space Agency was concluded in the course of 2008, pursuant to Article 54(2) of the EC Financial Regulation, allowing ESA to procure the Galileo deployment in the name and on behalf of the Commission. Therefore, the implementation of the above activities will not be detailed in this Work Programme. Finally, the Commission will procure performance monitoring facilities.

New satellite navigation applications are being developed every day, covering numerous sectors of the world economy. The expected global market in products and services will likely reach EUR 244 billion in 2020. The activities will give European industries the right opportunities to acquire the knowledge and expertise required in a strong international competing environment. Small and Medium Enterprises are key players for innovation in this sector.

The European infrastructure is being implemented in an incremental way. The overall GNSS performances will gradually improve, allowing the smooth development of receiver technologies and applications. The set of R&D activities will follow the incremental build-up of the infrastructure, i.e. EGNOS in 2009, four satellites for in orbit validation in 2011, and an 18 satellites initial operative constellation in 2014. The activities will build on existing infrastructure elements, including ground-based test and verification facilities.

⁵⁰ Council Regulation (EC) 683/2008 of 9 July 2008 (OJ L 196 24.07.2008).

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The 'GNSS Evolution programme' of the European Space Agency will maintain the technology at the state-of-the-art level. The activities within European GNSS Supervisory Authority and European Space Agency are coordinated.

The European GNSS, as a global navigation system, has a strong international dimension. All R&D activities will fully take into consideration the cooperation frame established with partner countries in order to promote the use of the European Navigation system worldwide.

The financial envelope foreseen to implement Galileo deployment activities (EUR 3.4 billion for EGNOS and Galileo), does not allow any more calls after the call 2011. **As a result there will be no calls for Galileo under the Theme Transport of the 2013 Work Programme.**

III.1. IMPLEMENTATION OF CALLS: AERONAUTICS AND AIR TRANSPORT – DG RTD

III.1.1. FP7- AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-1 (Main call)

- **Call identifier:** FP7-AAT-2013-RTD-1
- **Date of publication**⁵¹: 10 July 2012
- **Deadline**⁵²: 14 November 2012 at 17.00.00 (Brussels local time)
- **Indicative budget**⁵³: EUR 134.95 million

The indicative distribution of the call budget is as follows:

- EUR 37.91 million for topics funded via CP-FP (Level 1).
- EUR 88.04 million for topics funded via CP-IP (Level 2).
- EUR 6.00 million for CSA-CA.
- EUR 3.00 million for CSA-SA.

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.
- In case the budget of one or more funding schemes above could not be consumed (totally or partially), the remaining budget shall be transferred to the other funding schemes in accordance with the opinion of the evaluation review panel.

- **Topics called:**

CHALLENGE / ACTIVITY / Topics	Funding Schemes & eligibility criteria
CHALLENGE 1. ECO-INNOVATION	
ACTIVITY 7.1.1. THE GREENING OF AIR TRANSPORT	
AAT.2013.1-1. Flight physics	CP-FP <i>The requested EU contribution shall not exceed EUR 5 000 000</i>
AAT.2013.1-2. Aerostructures	CP-FP <i>The requested EU contribution shall not exceed EUR 5 000 000</i>
AAT.2013.1-3. Low pressure system for Ultra High By-Pass Ratio Engine. <i>Up to 1 project is expected to be funded.</i>	CP-IP <i>The requested EU contribution shall exceed EUR 5 000 000</i>
AAT.2013.1-4. Maturation of an integrated set of active flow, load and noise control technologies for the next generation of active wing, including in-flight demonstration.	CP-IP <i>The requested EU contribution shall exceed EUR 5 000 000</i>

⁵¹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁵² The Director-General responsible may delay this deadline by up to two months.

⁵³ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

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<i>Up to 1 project is expected to be funded.</i>	
CHALLENGE 2. SAFE AND SEAMLESS MOBILITY	
ACTIVITY 7.1.2. INCREASING TIME EFFICIENCY	
AAT.2013.2-1. Airports	CP-FP <i>The requested EU contribution shall not exceed EUR 5 000 000</i>
ACTIVITY 7.1.3. ENSURING CUSTOMER SATISFACTION AND SAFETY	
AAT.2013.3-1. Human factors	CP-FP <i>The requested EU contribution shall not exceed EUR 5 000 000</i>
CHALLENGE 3. COMPETITIVENESS THROUGH INNOVATION	
ACTIVITY 7.1.4. IMPROVING COST EFFICIENCY	
AAT.2013.4-1. Systems and equipment	CP-FP <i>The requested EU contribution shall not exceed EUR 5 000 000</i>
AAT.2013.4-2. Design systems and tools	CP-FP <i>The requested EU contribution shall not exceed EUR 5 000 000</i>
AAT.2013.4-3. Production	CP-FP <i>The requested EU contribution shall not exceed EUR 5 000 000</i>
AAT.2013.4-4. Maintenance, repair and disposal	CP-FP <i>The requested EU contribution shall not exceed EUR 5 000 000</i>
AAT.2013.4-5. Integrated environment for optimised airline maintenance and operations. <i>Up to 1 project is expected to be funded.</i>	CP-IP <i>The requested EU contribution shall exceed EUR 5 000 000</i>
AAT.2013.4-6. Integrated thermal analysis and design for aircraft. <i>Up to 1 project is expected to be funded.</i>	CP-IP <i>The requested EU contribution shall exceed EUR 5 000 000</i>
AAT.2013.4-7. Large scale demonstration of extended Distributed Modular Electronics. <i>Up to 1 project is expected to be funded.</i>	CP-IP <i>The requested EU contribution shall exceed EUR 5 000 000</i>
AAT.2013.4-8. Seamless aeronautical networking through integration of data links, radios and antennas extended beyond ATM. <i>Up to 1 project is expected to be funded.</i>	CP-IP <i>The requested EU contribution shall exceed EUR 5 000 000</i>
CROSS-CUTTING ACTIVITIES FOR IMPLEMENTING THE SUB-THEME PROGRAMME	
AAT.2013.7-1. Coordinating research and innovation in the field of Aeronautics and Air Transport. <i>Up to 1 project per domain is expected to be funded (see topic description).</i>	CSA-CA <i>The requested EU contribution shall not exceed EUR 1 200 000</i>

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AAT.2013.7-2. Coordinating research and innovation in the field of sustainable alternative fuels for Aviation. <i>Up to 1 project is expected to be funded</i>	CSA-CA <i>The requested EU contribution shall not exceed EUR 1 200 000</i>
AAT.2013.7-3. Communication of EU funded RTD project results to targeted audience. <i>Up to 1 project is expected to be funded.</i>	CSA-SA <i>The requested EU contribution shall not exceed EUR 600 000</i>
AAT.2013.7-4. Creating cohesive links and common knowledge between potential partners in EU Framework Programme Collaborative Projects. <i>Up to 1 project is expected to be funded.</i>	CSA-SA <i>The requested EU contribution shall not exceed EUR 600 000</i>
AAT.2013.7-5. Conference: support for the organisation of Aerodays. <i>Up to 1 project is expected to be funded.</i>	CSA-SA <i>The requested EU contribution shall not exceed EUR 600 000</i>
AAT.2013.7-6. Enhancing coordination and stimulating cooperation in research and innovation among EU Member States and Associated States to the EU Framework Programme. <i>Up to 1 project is expected to be funded.</i>	CSA-SA <i>The requested EU contribution shall not exceed EUR 600 000</i>
AAT.2013.7-7. Exploring opportunities and stimulating cooperation in research and innovation with China. <i>Up to 1 project is expected to be funded.</i>	CSA-SA <i>The requested EU contribution shall not exceed EUR 600 000</i>

- **Eligibility conditions:**

- The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- Table of standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation:

Funding scheme	Minimum conditions
Collaborative Projects - large scale integrating projects (CP-IP) Collaborative Projects - small or medium-scale focused research projects (CP-FP)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions aiming at coordinating research activities (CSA-CA)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions aiming at supporting research activities (CSA-SA)	At least 1 independent legal entity.

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Evaluation procedure:**

- There will be four ranking lists: list 1 CP-FP (Level 1); list 2 CP-IP (Level 2); list 3 CSA-CA; and list 4 CSA-SA.

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- The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme. Nonetheless, for list 1 CP-FP (Level 1), the highest rated proposal above thresholds in each topic will have priority over all the other proposals in this list.
 - Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
 - The Commission will instruct the experts to disregard any pages exceeding these limits.
 - The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).
 - The evaluation shall follow a single stage procedure.
 - Experts will not carry out the individual evaluation of proposals remotely.
 - The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme.
 - The evaluation will produce three ranked lists of proposals retained for funding with the corresponding reserve lists:
 - CP-FP (Level 1) and CSA-CA (coordinating)
 - CP-IP (Level 2)
 - CSA-SA (supporting)
- **Indicative timetable:**
 - Intended period for on-site (Brussels) evaluation / panel meetings: February 2013
 - Intended start date for grant agreement negotiations: March 2013
 - **Consortia agreements:** participants in Collaborative Projects are required to conclude a consortium agreement; participants in Coordination and Support Actions are encouraged, but not required, to conclude a consortium agreement.
 - **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.
 - **Flat rates to cover subsistence costs:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:
http://ec.europa.eu/research/participants/portal/page/fp7_documents
under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

III.1.2. FP7- AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-L0 (Open call for long term innovation)⁵⁴

- **Call identifier:** FP7-AAT-2012-RTD-L0
- **Date of publication**⁵⁵: 20 July 2011
- **Deadline**⁵⁶: 14 March 2013 at 17.00.00 (Brussels local time) – **Open Call**
- **Indicative budget**⁵⁷: EUR 5.00 million⁵⁸.

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary by up to 10% of the total value of the indicated budget for the call.

In case the budget cannot be consumed (totally or partially), the remaining budget will be returned to FP7-AAT-2013-RTD-1

- **Topics called:**

CHALLENGE / ACTIVITY / Topics	Funding Schemes & eligibility criteria
CHALLENGE 3. COMPETITIVENESS THROUGH INNOVATION	
ACTIVITY 7.1.6. PIONEERING THE AIR TRANSPORT OF THE FUTURE	
AAT.2012.6-1. Breakthrough and emerging technologies	CP-FP <i>The requested EU contribution shall not exceed EUR 600 000</i>
AAT.2012.6-2. Radical new concepts for air transport	CP-FP <i>The requested EU contribution shall not exceed EUR 600 000</i>

- **Eligibility conditions:**

- The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- Table of standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation:

Funding scheme	Minimum conditions
Collaborative Projects - small or medium-scale focused research projects (CP-FP)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC

⁵⁴ This is the continuation/extension of a call launched in Work Programme 2012.

⁵⁵ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁵⁶ The Director-General responsible may delay this deadline by up to two months.

⁵⁷ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

⁵⁸ An additional amount of EUR 5 million was allocated to this call from the 2013 budget; thus, in total EUR 10 million will be spent on this open call, approximately half of which has already been committed for proposals selected in the two first batches.

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.
- **Evaluation procedure:**
 - The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme.
 - The submission of proposals and evaluation shall follow a single stage procedure.
 - Pages limitations apply for the proposal: 10 pages for section 1 (excluding tables, etc.), 5 pages for section 2, and 5 pages for section 3.
 - The Commission will instruct the experts to disregard any pages exceeding these limits.
 - Weighting will be applied on the evaluation criteria as follows: 1) Scientific and Technological Excellence: 70%; 2) Implementation: 10%; and 3) Potential Impact: 20%.
 - The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left and right) should be at least 15 mm (not including any footers or headers).
 - In order to provide the necessary agility, it is strongly advised that *the numbers of applicants in a proposal does not exceed 7* and that *the project duration does not exceed 24 months*; deviations from this recommendation should be justified in the proposal.
 - Applicants must ensure that proposals conform to the page limits and layout given here, which details are provided in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
 - Experts may carry out the individual evaluation of proposals remotely.
 - The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme.
- **Indicative timetable:**

The open call will examine the submitted proposals in two batches with the following tentative deadlines: 25/10/2011 – 15/03/2012 – 4/10/2012 – 14/03/2013 (the two first tentative deadlines have been exceeded by now).
- **Consortia agreements:** participants in Collaborative Projects are required to conclude a consortium agreement.
- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.
- **Flat rates to cover subsistence costs:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:
http://ec.europa.eu/research/participants/portal/page/fp7_documents
under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

III.1.3. FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-RUSSIA

- **Call identifier:** FP7-AAT-2013-RTD-RUSSIA
- **Date of publication**⁵⁹: 10 July 2012
- **Deadline**⁶⁰: 14 November 2012 at 17.00.00 (Brussels local time)
- **Indicative budget**⁶¹: EUR 4.50 million

The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call. In case the total budget could not be consumed, the remaining amount shall be transferred to the main call (Call identifier: FP7-AAT-2013-RTD-1).

- **Notes:**
 1. The indicative budget of EUR 4.5 million will be used to fund the participants from the EU and Associated Countries.
 2. The Department of Aviation Industry (Ministry for Industry and Trade of the Russian Federation) will dedicate to this call a similar budget of EUR 4.5 million for the funding of the Russian participants, in accordance with the Russian Federation laws and regulations⁶².

- **Topics called:**

CHALLENGE / ACTIVITY / Topics	Funding Schemes & eligibility criteria
COORDINATED CALLS FOR INTERNATIONAL COOPERATION	
AAT.2013.8-1. Coordinated call with Russia. <i>Up to 1 project per domain is expected to be funded (see topic description).</i>	CP-FP <i>The requested EU contribution shall not exceed EUR 1 200 000</i>

- **Eligibility conditions:**
 - The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
 - Table of standard minimum number of participating legal entities for the funding scheme used in the call, in line with the Rules for Participation:

Funding scheme	Minimum conditions
Collaborative Projects - small or medium-scale focused research projects (CP-FP)	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC. At least 2 independent legal entities established in the Russian Federation.

⁵⁹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁶⁰ The Director-General responsible may delay this deadline by up to two months.

⁶¹ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

⁶² Under the condition that the corresponding annual budget is adopted by the Russian Federation budget authority.

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.
- **Additional eligibility criterion:**
 - At least 2 independent legal entities established in the Russian Federation.
- **Evaluation procedure:**
 - The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme.
 - Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
 - The Commission will instruct the experts to disregard any pages exceeding these limits.
 - The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).
 - The evaluation shall follow a single stage procedure.
 - Experts will not carry out the individual evaluation of proposals remotely.
 - The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme.
 - In addition, the Russian proposal part of the proposal relevant to Russian work in the project will be evaluated by the Department of Aviation Industry (Ministry for Industry and Trade of the Russian Federation) according to its procedures.
 - Only proposals which have passed satisfactorily both the EC and Russian evaluations may be selected for funding.
- **Indicative timetable:**
 - Intended period for on-site (Brussels) EC evaluation / panel meetings: February 2013
 - Intended start date for grant agreement negotiations: June 2013
- **Consortia agreements:** participants in Collaborative Projects are required to conclude a consortium agreement.
- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.
- **Flat rates to cover subsistence costs:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:
http://ec.europa.eu/research/participants/portal/page/fp7_documents
under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

III.1.4. FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-HIGH SPEED (Coordinated call with Australia, Japan and the Russian Federation, and possibly other Third Countries, on civil high speed air transport research)

- **Call identifier: FP7-AAT-2013-RTD-HIGH SPEED**
- **Date of publication⁶³:** 10 July 2012
- **Deadline⁶⁴:** 29 March 2013 at 17.00.00 (Brussels local time)
- **Indicative budget⁶⁵:** EUR 5.00 million

The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call. In case the total budget could not be consumed, the remaining amount shall be transferred to the main call (Call identifier: FP7-AAT-2013-RTD-1).

- **Notes:**
 1. This coordinated call foresees to lead to the funding of a coherent research programme on Civil High Speed Aircraft, consisting of one project financed by the European Union and **at least two complementary projects** funded either by the Australian, Japanese or the Russian Federation authorities / funding organisations.
 2. Provided that the additional eligibility criterion stipulated in the call fiche is met (i.e. coordination of the EU proposal with at least two complementary proposals or projects from the following countries: Australia, Japan and the Russian Federation), the involvement of other Third Countries' additional participants is a priori not excluded, provided that such participation is justified and complies fully with the requirements of this call.
 3. In parallel to the present European call for proposals, the Ministry of Economy, Trade and Industry of Japan (METI) and the Ministry of Industry and Trade of the Russian Federation are expected to publish in due time coordinated calls according to their own rules and procedures for the selection of complementary research projects which, once approved by the relevant authorities, will run in parallel to the European project in a harmonised and synchronised way. Likewise, Australia is expected to set up a complementary project according to its rules and procedures.
 4. The detailed information relative to these coordinated calls or projects is expected to be provided in due time on the relevant web site in each of the concerned Ministries or funding organisations of the Countries involved. Further details will be provided in the Guide for Applicants (specific part).
 5. The indicative EU budget of EUR 5 million will be used to fund one EU project according to the Seventh Framework Programme (FP7) rules of participation. In addition to this public funding, a contribution is expected from the partners involved in this project according to the FP7 funding rules. Such contribution to the project could possibly bring another EUR 2.5 million leading to a total budget for the EU project of around EUR 7.5 million (see also items 6 and 7 below).
 6. The concerned funding authorities/organisations (public and /or private) of Australia, Japan, the Russian Federation and possibly of other Third Countries will dedicate as far

⁶³ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁶⁴ The Director-General responsible may delay this deadline by up to two months.

⁶⁵ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

as possible to a complementary national project an equivalent amount of resources⁶⁶, in order to have a balanced and synchronised effort from all parties involved.

7. In order to ensure that these projects from Australia, Japan, the Russian Federation and possibly from other Third Countries are technically complementary to form a coherent research programme and represent, as far as possible, a similar budget (around EUR 7.5 million, total cost for each project), in a spirit of balanced cooperation and efforts, the preparation of the project proposals needs clearly to be closely coordinated between the concerned stakeholders of the countries involved.
8. The EU proposal and more widely the coherent research programme resulting from this set of complementary research projects shall build upon and be complementary to, as far as possible, already running (or finished projects) and avoid duplication of research work.

• **Topics called:**

CHALLENGE / ACTIVITY / Topics	Funding Schemes & eligibility criteria
ACTIVITY 7.1.6. PIONEERING THE AIR TRANSPORT OF THE FUTURE	
AAT.2013.8-2. International cooperation on civil high speed air transport research. <i>Up to 1 project is expected to be funded.</i>	Collaborative Project <i>The requested EU contribution shall not exceed EUR 5 000 000</i>

• **Eligibility conditions:**

- The general eligibility criteria are set out in Annex 2 to this work programme and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- Table of standard minimum number of participating legal entities for the funding scheme used in the call, in line with the Rules for Participation:

Funding scheme	Minimum conditions
Collaborative Projects (CP)	At least 3 independent legal entities, each of which is established in a EU MS or AC, and no two of which are established in the same EU MS or AC.

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

• **Additional eligibility criterion:**

A proposal submitted to the European Commission (EC) will be eligible only if it is coordinated with **at least two** complementary proposals either submitted in parallel or to be

⁶⁶ Under the condition that the corresponding annual budget or overall budget is adopted by the Australian, Japanese and the Russian Federation budget authorities/organisations, respectively.

submitted afterwards to the corresponding funding authorities/organisations of Australia, Japan or the Russian Federation **or with at least two** complementary projects already selected for funding by these Third Countries to be synchronised in time with the EU project.

• **Evaluation procedure:**

- The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme.
- In addition, proposals should contain in their description of work (Part B) the following information which will be evaluated against criterion 1 (S/T excellence):
 1. the common objectives, the scope and content of the intended international cooperation;
 2. all activities that will be carried out by the participants in the EU proposal, including the work schedule, deliverables, milestones and budget;
 3. all activities that will be carried out in the Australian, Japanese, the Russian Federation or other Third Country proposal, including the work schedule, deliverables, milestones and budget;
 4. the interdependencies between the R&D activities carried out by the European and each of other countries' participants respectively, in terms of deliverables, milestones, etc.; and
 5. a formal signed commitment from the other complementary proposals or projects representatives that they will conclude between them a coordination agreement prior to the start of the research programme.

By and large, the Description of work (Part B) of the project proposal should constitute a coherent and ambitious research programme providing a complete overview of the research to be carried out in all complementary projects.

- The balancing between the EU total research effort and budget (EU funding + participant funding) and the total research effort and budget of the complementary projects will be evaluated against criterion 2 (quality and efficiency of the implementation and the management).
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
- The Commission will instruct the experts to disregard any pages exceeding these limits.
- The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).
- The evaluation shall follow a single stage procedure and may be carried out remotely.
- Proposals submitted to the present European call for proposals will be evaluated according to the FP7 rules by independent experts, as far as possible involving experts from the Third Countries taking part in this coordinated call.
- The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme.
- In addition, the evaluation and selection of the complementary Australian, Japanese, the Russian Federation or other Third Country national project proposals, when applicable, will be carried out by the concerned authorities/organisations respectively, according to their own rules and procedures.
- EU selected proposals will be funded only if their complementary Third Countries' proposals will also be successfully selected for funding in due time and forming altogether a coherent research programme.

- **Indicative timetable:**
 - Evaluations are expected to be carried out in April/May 2013.
 - It is expected that the negotiations for the selected proposals will open by May/June 2013.
 - Negotiations are expected to be carried out in parallel by the European Commission and the authorities/organisations concerned in Australia, Japan, the Russian Federation and other possible Third Countries in order to have, as far as possible, a simultaneous start of the respective grant agreement, tentatively by July-September 2013.
- **Consortia agreements:** participants in the EU collaborative project are required to conclude a consortium agreement prior to the signature of the grant agreement.
- **Coordination agreements:** Participants in the EU collaborative project are required to conclude, prior to the signature of the EU Grant Agreement, a coordination agreement with the participants in the other complementary national projects which are part of this coherent research programme on Civil High Speed Aircraft.
- **The forms of grants and maximum reimbursement rates** which will be offered for EU participants are specified in Annex 3 to the Cooperation work programme.
- **Flat rates to cover subsistence costs for EU participants:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:
http://ec.europa.eu/research/participants/portal/page/fp7_documents
under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

III.2. IMPLEMENTATION OF CALLS: SUSTAINABLE SURFACE TRANSPORT – DG RTD

III.2.1. FP7- SUSTAINABLE SURFACE TRANSPORT (SST)-2013-RTD-1 (including the ‘European Green Cars Initiative’)

- **Call identifier:** FP7-SST-2013-RTD-1
- **Date of publication**⁶⁷: 10 July 2012
- **Deadline**⁶⁸: 14 November 2012 at 17.00.00 (Brussels local time)
- **Indicative budget**⁶⁹: EUR 110.95 million

The indicative distribution of the call budget is as follows:

- EUR 23.00 million for Group of topics (GT) N° 1: Increasing railway capacity.
- EUR 17.00 million for Group of topics (GT) N° 2: Ensuring safe, green and competitive waterborne transport.
- EUR 38.95 million for Group of topics (GT) N° 3: Implementing research for the ‘European Green Car Initiative’.
- EUR 20.40 million for Group of topics (GT) N° 4: It includes sustainable urban mobility, improving surface transport through ITS, infrastructures, safety and security.
- EUR 7.20 million for topic SST.2013.6-1: Strengthening the research and innovation strategies of the transport industries in Europe.
- EUR 0.40 million for topic SST.2013.6-3: Organisation of Transport Research Awards for the Transport Research Arena (TRA) conference.
- EUR 3.00 million for topic TPT.2013-1: Technology transfer in the area of Transport.
- EUR 0.50 million for topic TPT.2013-2: Mapping regional capacities in transport research and innovation.
- EUR 0.50 million for topic: TPT.2013-3: Ex-post evaluation of the Transport (including AAT) theme of the FP7 ‘Cooperation’ specific programme.

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.
- In case the budget of one or more sub-divisions could not be consumed (totally or partially), the remaining budget shall be transferred to the other sub-divisions in accordance with the opinion of the evaluation review panel.

- **Topics called:**

CHALLENGE / ACTIVITY / Topics	GT N°	Funding Schemes & eligibility criteria
CHALLENGE 1. ECO-INNOVATION		

⁶⁷ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁶⁸ The Director-General responsible may delay this deadline by up to two months.

⁶⁹ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

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ACTIVITY 7.2.1. THE GREENING OF SURFACE TRANSPORT		
SST.2013.1-1. Railway infrastructure optimisation and monitoring for further noise reduction	1	CP-FP <i>The requested EU contribution shall not exceed EUR 3 000 000</i>
SST.2013.1-2. Towards the zero emission ship. <i>Up to 1 project is expected to be funded</i>	2	CP <i>The requested EU contribution shall not exceed EUR 9 000 000</i>
CHALLENGE 2. SAFE AND SEAMLESS MOBILITY		
ACTIVITY 7.2.2. ENCOURAGING MODAL SHIFT AND DECONGESTING TRANSPORT CORRIDORS		
SST.2013.2-1. Next generation of train control systems in the domain of urban and main line European railway systems. <i>Up to 1 project is expected to be funded.</i>	1	CP <i>The requested EU contribution shall not exceed EUR 7 000 000</i>
SST.2013.2-2. New concepts for railway infrastructure and operation: adaptable, automated, resilient and high-capacity. <i>Up to 1 project is expected to be funded.</i>	1	CP <i>The requested EU contribution shall not exceed EUR 10 000 000</i>
ACTIVITY 7.2.3. ENSURING SUSTAINABLE URBAN MOBILITY		
SST.2013.3-1. Managing integrated multimodal urban transport network. <i>Up to 1 project is expected to be funded.</i>	4	CP <i>The requested EU contribution shall not exceed EUR 9 000 000</i>
SST.2013.3-2. Implementing innovative and green urban transport solutions in Europe and beyond	4	CSA-CA <i>The requested EU contribution shall not exceed EUR 2 000 000</i>
ACTIVITY 7.2.4. IMPROVING SAFETY AND SECURITY		
SST.2013.4-1. Ships in operation. <i>Up to 1 project is expected to be funded.</i>	2	CP <i>The requested EU contribution shall not exceed EUR 5 000 000</i>
SST.2013.4-3. Biomechanics and advanced digital human body models and testing for vehicle safety	4	CP-FP <i>The requested EU contribution shall not exceed EUR 3 000 000</i>
CHALLENGE 3. COMPETITIVENESS THROUGH INNOVATION		
ACTIVITY 7.2.5. STRENGTHENING COMPETITIVENESS		
SST.2013.5-1. Technical requirements for the certification of new materials for railway rolling stock	1	CP-FP <i>The requested EU contribution shall not exceed EUR 3 000 000</i>
SST.2013.5-2. Low cost flexible automation and mechanisation in small to medium shipyards	2	CP-FP <i>The requested EU contribution shall not exceed EUR 3 000 000</i>
SST.2013.5-3. Innovative, cost-effective construction and maintenance for safer, greener and climate resilient roads	4	CP-FP <i>The requested EU contribution shall not exceed EUR 3 000 000</i>

CROSS-CUTTING ACTIVITIES FOR IMPLEMENTING THE SUB-THEME PROGRAMME		
SST.2013.6-1. Strengthening the research and innovation strategies of the transport industries in Europe. <i>Up to 1 project per surface transport mode is expected to be funded (see topic description).</i>		CSA-SA
SST.2013.6-3. Organisation of Transport Research Awards for the Transport Research Arena (TRA) conference <i>Up to 1 project is expected to be funded.</i>		CSA-SA <i>The requested EU contribution shall not exceed EUR 400 000</i>
THE 'EUROPEAN GREEN CARS INITIATIVE'		
GC.SST.2013-1. Feasibility analysis and technological development of on-road charging for long term electric vehicle range extension. <i>Up to 1 project is expected to be funded.</i>	3	CP <i>The requested EU contribution shall not exceed EUR 10 000 000</i>
GC.SST.2013-2. Next generation electric motors	3	CP-FP <i>The requested EU contribution shall not exceed EUR 3 000 000</i>
GC.SST.2013-3. Future light urban electric vehicles	3	CP-FP <i>The requested EU contribution shall not exceed EUR 3 000 000</i>
GC.SST.2013-5. Configurable and adaptable truck. <i>Up to 1 project is expected to be funded.</i>	3	CP <i>The requested EU contribution shall not exceed EUR 8 000 000</i>
GC.SST.2013-6. High efficiency energy conversion for future heavy duty transport	3	CP-FP <i>The requested EU contribution shall not exceed EUR 3 000 000</i>
GC.SST.2013-7. Technical and operational connectivity in intermodal freight transport	3	CP-FP <i>The requested EU contribution shall not exceed EUR 3 000 000</i>
HORIZONTAL ACTIVITIES FOR IMPLEMENTING THE TRANSPORT PROGRAMME		
TPT.2013-1. Technology transfer in the area of Transport		CP-FP <i>The requested EU contribution shall not exceed EUR 3 000 000</i>
TPT.2013-2. Mapping regional capacities in transport research and innovation. <i>Up to 1 project is expected to be funded.</i>		CSA-SA <i>The requested EU contribution shall not exceed EUR 500 000</i>
TPT.2013-3. Ex-post evaluation of the Transport (including AAT) theme of the FP7 'Cooperation' specific programme. <i>Up to 1 project is expected to be funded.</i>		CSA-SA <i>The requested EU contribution shall not exceed EUR 500 000. The duration of the support action shall not exceed 12 months.</i>

- **Eligibility conditions:**

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- The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- Table of standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation:

Funding scheme	Minimum conditions
Collaborative Projects (CP) Collaborative Projects - large scale integrating projects (CP-IP) Collaborative Projects - small or medium-scale focused research projects (CP-FP)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions aiming at coordinating research activities (CSA-CA)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions aiming at supporting research activities (CSA-SA)	At least 1 independent legal entity.

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.
- **Evaluation procedure:**
 - The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme.
 - Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
 - The Commission will instruct the experts to disregard any pages exceeding these limits.
 - The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).
 - The evaluation shall follow a single stage procedure.
 - Proposals may be evaluated remotely
 - The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme.
 - No hearings are foreseen.
 - The evaluation will produce the following ranked lists of proposals retained for funding with the corresponding reserve lists:
 - Group of topics N° 1
 - Group of topics N° 2
 - Group of topics N° 3
 - Group of topics N° 4
 - Topic SST.2013.6-1
 - Topic SST.2013.6-3
 - Topic TPT.2013-1
 - Topic TPT.2013-2
 - Topic TPT.2013-3

- **Indicative timetable:**
 - Intended period for evaluation and panel meetings: January to March 2013
 - Intended start date of grant agreement negotiations: April 2013
- **Consortia agreements:** participants in Collaborative Projects are required to conclude a consortium agreement; participants in Coordination and Support Actions are encouraged, but not required, to conclude a consortium agreement.
- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.
- **Flat rates to cover subsistence costs:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:
http://ec.europa.eu/research/participants/portal/page/fp7_documents
under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

III.3. IMPLEMENTATION OF CALLS: TRANSPORT – DG MOVE

- **Call identifier: FP7-TRANSPORT-2013-MOVE-1**
- **Date of publication⁷⁰:** 10 July 2012
- **Deadline⁷¹:** 14 November 2012 at 17.00.00 (Brussels local time)
- **Indicative budget⁷²:** EUR 25.00 million

The final budget awarded to actions implemented through this call for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

Topics called:

CHALLENGE / ACTIVITY / Topics	Funding Schemes & eligibility criteria
CHALLENGE 2. SAFE AND SEAMLESS MOBILITY	
ACTIVITY 7.2.3. ENSURING SUSTAINABLE URBAN MOBILITY	
SST.2013.3-3. Capitalising CIVITAS knowledge and experience	CSA-CA <i>The requested EU contribution shall not exceed EUR 4 000 000</i>
ACTIVITY 7.2.4. IMPROVING SAFETY AND SECURITY	
SST.2013.4-2. Inspection capabilities for enhanced ship safety. <i>Up to 1 project is expected to be funded.</i>	CP <i>The requested EU contribution shall not exceed EUR 3 000 000</i>
CROSS-CUTTING ACTIVITIES FOR IMPLEMENTING THE SUB-THEME PROGRAMME	
SST.2013.6-2. Towards a competitive and resource efficient port transport system. <i>Up to 1 CP and 1 CSA-CA are expected to be funded.</i>	CP / CSA-CA <i>The requested EU contribution for a CP shall not exceed EUR 3 000 000 and its duration 48 months. The requested EU contribution for a CSA-CA shall not exceed EUR 1 500 000 and its duration 30 months</i>
THE ‘EUROPEAN GREEN CARS INITIATIVE’	
GC.SST.2013-4. Demonstration of electric buses as urban public transport. <i>Up to 1 project is expected to be funded.</i>	CP <i>The requested EU contribution shall not exceed EUR 13 500 000</i>

- **Eligibility conditions:**
 - The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B

⁷⁰ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁷¹ The Director-General responsible may delay this deadline by up to two months.

⁷² Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

of the proposal shall be readable, accessible and printable.

- Table of standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation:

Funding scheme	Minimum conditions
Collaborative Projects (CP)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions aiming at coordinating research activities (CSA-CA)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Evaluation procedure:**

- The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme.
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
- The Commission will instruct the experts to disregard any pages exceeding these limits.
- The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).
- The evaluation shall follow a single stage procedure.
- Proposals may be evaluated remotely.
- The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme.
- No hearings are foreseen.

- **Indicative timetable:**

- Intended period for evaluation and panel meetings: January to March 2013.
- Intended start date of grant agreement negotiations: April 2013

- **Consortia agreements:** participants in Collaborative Projects are required to conclude a consortium agreement; participants in Coordination and Support Actions are encouraged, but not required, to conclude a consortium agreement.

- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Flat rates to cover subsistence costs:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:

http://ec.europa.eu/research/participants/portal/page/fp7_documents

under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

**V. INDICATIVE BUDGET FOR TRANSPORT (INCLUDING AERONAUTICS)
THEME FOR THE 2013 WORK PROGRAMME**

A. DG RTD indicative budget for the 2013 Work Programme⁷³

European Commission - DG Research	2013 (million EUR)
FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-1	134.95
FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-L0	5.00
FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-RUSSIA	4.50
FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-HIGH SPEED	5.00
FP7-SUSTAINABLE SURFACE TRANSPORT (SST)- 2013-RTD-1 (including the 'European Green Cars Initiative')	110.95
'The Ocean of Tomorrow 2013' (FP7-OCEAN-2013) ⁷⁴	10.00
FP7-ERANET-2013-RTD ⁷⁵	4.00*
FP7-TRANSPORT-2013-MOVE-1	25.00
Total for calls for proposals	299.40
General activities (cf. Annex 4) (details below)	5.04
Other activities:	
Evaluations, monitoring and review	1.12
Estimated total budget allocation	305.56

* Indicative amount for ERA-NET. An ERA-NET Plus is included in Work Programme 2013 for Transport (including Aeronautics): SST.2013.1-3 - ERA-NET Plus 'Advanced systems, materials and techniques for next generation infrastructure'; which is part of the FP7-ERANET-2013-RTD joint call.

⁷³ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority.

⁷⁴ The call fiche with all relevant information can be found in the Work Programme of Theme 2 (Food, Agriculture, Fisheries and Biotechnology) as well as on the Participant Portal under the call page FP7-OCEAN-2013.

⁷⁵ See Annex 4 to the Cooperation work programme.

B. DG MOVE indicative budget for the 2013 Work Programme⁷⁶

European Commission - DG Mobility and Transport	2013 (million EUR)
General activities (cf. Annex 4) (details below)	0.00
Other activities:	
SESAR	60.01
Evaluation	0.00
Monitoring	0.50
Audits	0.30
Estimated total budget allocation	60.81

C. DG ENTR indicative budget for the 2013 Work Programme⁷⁷

European Commission - DG Enterprise and Industry	2013 (million EUR)
General activities (cf. Annex 4) (details below)	2.41
Galileo delegation agreement ESA to cover the deployment phase of the GNSS programme, as stated in the introduction of chapter 7.4	147.15
Estimated total budget allocation	149.56

All budgetary figures given in this work programme are indicative. The final budgets may vary following the evaluation of proposals.

The final budget awarded to actions implemented through calls for proposals may vary:

- The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

For actions not implemented through calls for proposals:

- The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions;
- The final budget awarded for all other actions not implemented through calls for proposals may vary by up to 10% of the indicated budget for these actions.

⁷⁶ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority.

⁷⁷ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority.

D. Summary of RTD budget allocation to general activities for 2013 (cf. Annex 4)

European Commission - DG Research	2013 (million EUR)
Cordis	0.790
Eureka / Research organisations	0.040
COST	4.203
Experts (evaluators and reviewers)	0.010
Total	5.043

E. Summary of MOVE budget allocation to general activities for 2013 (cf. Annex 4)

European Commission - DG Mobility and Transport	2013 (million EUR)
Cordis	0.00
Eureka / Research organisations	0.00
COST	0.00
Strategy oriented support actions	0.00
Total	0.00

F. Summary of ENTR budget allocation to general activities for 2013 (cf. Annex 4)

European Commission - DG Enterprise and Industry	2013 (million EUR)
Cordis	0.282
Eureka/Research organisations	0.014
COST	2.110
Experts (evaluators and reviewers)	0.004
Total	2.410

WORK PROGRAMME 2013

COOPERATION

THEME 8

SOCIO-ECONOMIC SCIENCES AND HUMANITIES

(European Commission C (2012) 4536 of 09 July 2012)

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OBJECTIVE

Generating an in-depth, shared understanding of complex and interrelated socio-economic challenges Europe is confronted with, such as growth, employment and competitiveness, social cohesion and inclusion, social, cultural and educational challenges in an enlarged EU, as well as issues of sustainability, environmental challenges, demographic change, migration and integration, quality of life and global interdependence, in particular with a view to providing an improved knowledge base for policies in the fields concerned.

I CONTEXT

Political landscape

Against the backdrop of the current economic situation and increased global competition, the Union has defined a Europe 2020 strategy to support growth and job creation. The Innovation Union Flagship initiative supports this strategy through specific commitments. Research and innovation are key drivers of competitiveness, jobs, sustainable growth and social progress.

The work programme 2013 aligns with, and contributes towards, the objectives of Europe 2020, the Innovation Union Flagship, and other EU policies. There is a reinforced focus on fostering new ideas, supporting world class teams tackling significant societal challenges, and ensuring that the fruits of our investments can be properly exploited.

In this way the work programme provides for a smooth transition towards Horizon 2020, which is the new research and innovation programme for 2014-2020.

Approach for 2013

This work programme contributes to the following priority themes:

- **Public sector reform**

The financial and economic crisis, alongside ongoing demographic change, has exacerbated the challenges facing the public sector in Europe. Successful economic recovery, raising employment and ensuring the long-term sustainability of public finances require new approaches to public policy and the role of the State.

The following topics make a major contribution to addressing these issues:

SSH.2013.1.1-2. Intangibles in the public sector – an unrecognised source and facilitator for innovation, well-being and smart growth;

SSH.2013.1.2-1. Overcoming youth unemployment in Europe

SSH.2013.1.3-1. The impact of ageing societies on public finances in Europe

SSH.2013.1.3-2. Better integrating financial markets into, policy focused, macro models

SSH.2013.2.1-4. The future of the welfare state

SSH.2013.3.1-1. Addressing European governance of transnational mobility: assessing forms of temporary migration

SSH.2013.5.1-1. Citizens' resilience in times of crisis

SSH-2013.5.1-2. Addressing demand in anti-trafficking efforts and policies

- **Smart Cities**

Socio-economic aspects of developing smart cities in Europe will be addressed within the following topic:

SSH-2013.7.1-1. Post-carbon cities in Europe: a long-term outlook

- **Bio-resource efficiency**

Socio-economic aspects of this priority will be addressed within the following topic:

SSH-2013.2.1-1. Obstacles and prospects for sustainable lifestyles and green economy in Europe

In addition, in line with the spirit of the ‘re-launched’ European Research Area (ERA), the 2013 SSH work programme focuses on a number of other strategic societal challenges. These were selected by taking into account, for instance, the Europe 2020 strategy¹ and the Innovation Union Flagship Initiative², inputs from the Member States³, the SSH Advisory Group⁴, and other Directorates-General of the European Commission. The themes selected for this work programme are also firmly rooted in research that is already funded and aim to create a bridge towards Horizon 2020 with particular attention being paid to topics that are relevant to public sector reform and focus on enhancing growth.

This approach is reflected in the remaining three priorities of the work programme:

- **Underpinning innovation for smart growth**, including themes such as *Economic underpinnings of social innovations; Social entrepreneurship for innovative and inclusive societies; Social innovation – empowering people, changing societies?; Transmitting and benefiting from cultural heritage in Europe.*
- **Inclusive growth**, including themes such as *Early childhood education and care and the cost of inequities; The impact of the third sector on socio-economic development in Europe; The multicultural challenge for the European citizen; Towards a European longitudinal childhood and youth survey in Europe;.*
- **Support for developing the external policies of the European Union**, including themes such as *The role of multinational companies in addressing global development challenges; Security and democracy in the neighbourhood: the case of the Caucasus; Facing transition in the South and East Mediterranean area: empowering the young generation; Media in conflicts and peace building; EU-India social sciences and humanities platform; Transatlantic social sciences and humanities platform; Untapped potential for growth and employment – reducing the cost of non-tariff measures in goods, services and investment.*

As can be seen from the above, the Socio-economic Sciences and Humanities programme makes a strong commitment to implementing the Innovation Union Initiative in areas where clear added value can be achieved.

¹ <http://ec.europa.eu/eu2020/>.

² http://ec.europa.eu/research/innovation-union/index_en.cfm.

³ Through the Programme Committee assisting the European Commission in the implementation of the Theme Socio-economic Sciences and Humanities of the Cooperation Specific Programme.

⁴ It is the mandate of the Socio-economic Sciences and Humanities Advisory Group to provide advice to the Commission services regarding the Theme Socio-economic Sciences and Humanities of the Cooperation Specific Programme with a view to strategy, relevant objectives and scientific priorities.

Furthermore, while supporting the EU research and innovation strategy, the work programme seeks to strengthen the European Research Area in the field of Socio-economic Sciences and Humanities. In this respect, the research projects should adopt multidisciplinary approaches, promote comparative analysis and, where relevant, include forward-looking activities. Projects should, whenever possible, involve dialogue between the scientific community, stakeholders and policy-makers in Europe and beyond.

Dissemination

Proposals should develop clear, targeted dissemination and valorisation strategies, including the use of new media that address and involve not just scientific audiences, but also policy-makers, civil society organisations and other key actors and, where appropriate, the general public. These strategies should be an integral part of the projects, to be implemented from an early stage in the project life cycle.

Expected impact

The work programme will contribute to the goal of smart, sustainable and inclusive growth. Socio-economic Sciences and Humanities are an important cornerstone in this respect. Such growth cannot be achieved unless EU citizens have a sound, shared understanding of the key challenges facing their society, the factors, actors and trends leading to convergence or divergence in European societies, as well as between Europe and other key actors on the global scene. In particular, the work programme will support the development of the Innovation Union Flagship, including some of its key initiatives such as reinforcing social innovation. The work programme will also help to strengthen the EU's external policies, and should enhance efforts to ensure peace, stability, human rights, mutual understanding, cultural exchanges and economic development. The work programme will therefore encourage research which directly supports European, national or regional policy-making by providing a comparative knowledge base and evidence.

Innovation dimension of the activities and bridging towards Horizon 2020

The 2013 SSH work programme supports broader aspects of innovation, in particular through topics addressing creativity and intangible assets (*Transmitting and benefiting from cultural heritage in Europe* and *Intangibles in the public sector – an unrecognised source and facilitator for innovation, well-being and smart growth*) as well as topics that focus in particular on social innovation (*Economic underpinnings of social innovations* and *Social innovation – empowering people, changing societies?*) or address one of its components (*Social entrepreneurship for innovative and inclusive societies*). Research on the latter topic is expected to involve entrepreneurs, while the topic on *The role of multinational companies in addressing global development challenges* will address new business models and will involve both larger companies and other users. In addition to this, the topic on *Obstacles and prospects for sustainable lifestyles and green economy in Europe* will analyse the potential for and effectiveness of public procurement.

In order to create an effective bridge to Horizon 2020, the SSH Work Programme for 2013 is continuing the strategy launched in 2010 in order to focus on societal challenges. In particular, the majority of the activities we propose are directly linked to inclusive, innovative and secure societies. They include, among others, research on overcoming youth unemployment, on social innovation and on addressing trafficking of human beings.

Strengthening the European Research Area

All activities proposed in this work programme will reinforce the European Research Area by fostering collaboration between researchers across Europe and by promoting a comparative perspective on societal challenges. In particular, the Socio-economic Sciences and Humanities programme places emphasis on open access to research results and on gender equality and the gender dimension of research. Specific measures to strengthen the European Research Area focus on reinforcing cooperation and synergies between national research policies and activities, as well as their coordination at European level. This will be implemented in particular through the following topics:

SSH.2013.2.1-4. The future of the welfare state

SSH.2013.4.3-1. EU-India social sciences and humanities platform

SSH.2013.4.3-2. Transatlantic social sciences and humanities platform

Open Access

The aim of Open Access, which is defined as free access over the internet, is to improve and promote the dissemination of knowledge, thereby improving the efficiency of scientific discovery and maximising the return on investment in R&D by public research funding bodies. Beneficiaries who are funded partially or entirely by the Socio-economic Science and Humanities Programme are required to deposit peer-reviewed articles resulting from their projects in an institutional or subject-based repository, and to make their best efforts to ensure open access to these articles within 12 months.⁵

Gender

All projects are encouraged to have a balanced participation of women and men in their research activities and to raise awareness on combating gender prejudices and stereotypes. Gender issues should be addressed as an integral part of the research to ensure the highest level of scientific quality. The following Topics involve an explicit gender dimension:

SSH.2013.1.2-1. Overcoming youth unemployment in Europe

SSH.2013.1.3-1 The impact of ageing societies on public finances in Europe

SSH.2013.3.1-1. Addressing European governance of transnational mobility: assessing forms of temporary migration

SSH.2013.4.1-2. Facing transition in the South and East Mediterranean area: empowering the young generation

SSH-2013.5.1-1. Citizens' resilience in times of crisis

SSH-2013.5.1-2. Addressing demand in anti-trafficking efforts and policies

International Cooperation

Researchers and research institutions from International Cooperation Partner Countries (ICPC)⁶ are strongly encouraged to take part in proposals submitted under all Topics in this work programme. Participation of (a) relevant non-EU country partner(s) could enhance the scientific and technological excellence of projects and enable the research to have a greater impact. Under Activities 2 and 4, this work programme includes three Specific cooperation actions dedicated to international cooperation: *SSH.2013.2.1-3 The role of multinational*

⁵ Further information: http://ec.europa.eu/research/participants/portal/page/fp7_documentation.

⁶ Please see Annex 1 of the 'Cooperation' work programme for the list of International Cooperation Partner Countries (ICPC).

companies in addressing global development challenges; SSH.2013.4.1-1 Security and democracy in the neighbourhood: the case of the Caucasus; and SSH.2013.4.1-2 Facing transition in the South and East Mediterranean area: empowering the young generation.

Additionally, the *EU-India social sciences and humanities platform* and the *Transatlantic social sciences and humanities platform* will encourage more effective, structured and coherent international scientific cooperation in the social sciences and humanities at global level.

Cross-thematic approaches

In preparation of the 2013 SSH work programme research covered under other themes has been taken into account. No joint or coordinated calls are used. However, there are two topics that are of particular relevance for other themes: *SSH.2013.2.1-1. Obstacles and prospects for sustainable lifestyles and green economy in Europe* is relevant also for Theme 5: Energy and Theme 6: Environment (including climate change); and *SSH-2013.5.1-2. Addressing demand in anti-trafficking efforts and policies* complements a topic on the fight against trafficking in human beings under Theme 10: Security.

Theme-specific information

This work programme⁷ is structured in terms of *Activities*⁸ which are subdivided into *Areas*⁹ and *Topics*. Proposals are invited at the level of *Topics* (implemented with small to medium-size or large collaborative projects or other instruments). Proposals must make a clear and significant contribution to the core objectives described in each *Area* in accordance with the specificities of the *Topic*.

Topics for research projects

This work programme includes topics for 'small or medium-scale focused research projects' and for 'large-scale integrating projects', either focusing on urgent needs or addressing an important European phenomenon. Proposals need to address the research agenda described under each *Topic* with a focus on the production of new knowledge, the interface with the needs of policy-makers and other interested stakeholders, and on strengthening the capability of the Socio-economic Sciences and Humanities to contribute to the continuing development of the European Research Area.

The work programme proposes a research agenda for each topic, and proposals are expected to address the core subjects to the greatest possible extent. The composition and size of proposed consortia should adequately reflect the proposed research agenda and allow for a convincing and efficient management structure. Large-scale integrating projects, in particular, are encouraged to include a comprehensive stock-taking of previous research as well as forward-looking/foresight analysis on likely developments within that research field, where relevant.

⁷ Please note that when not specified otherwise the term 'work programme' refers to the Socio-economic Science and Humanities part of the 'Cooperation' Specific Programme work programme.

⁸ The work programme Activities correspond to the activities set out in theme specific part of the 'Cooperation' Specific programme.

⁹ An Area is used to describe part of an Activity.

All research proposals are expected to:

- Provide an appropriate comparative perspective and the widest possible European (international, where applicable) coverage in relation to the research (although not necessarily simply via a geographically-diverse consortium);
- Develop quantitative and qualitative analyses, if possible by separating age groups, where appropriate;
- Achieve cooperation within and between disciplines and involve a plurality of approaches to the degree most appropriate for the issues addressed;
- Involve users and stakeholders in the implementation of the project, as appropriate;
- Define and pursue appropriate strategies for making the data generated in the project available to the broader research community¹⁰;
- Consider ethical and gender aspects in the conduct and the content of research.

Including the humanities

Based on an explicit request from the scientific community and the Member States, the work programme ensures that humanities research receives proper attention by drawing on the wealth of knowledge and experience of humanities researchers in addressing European challenges.

While the humanities can make valuable contributions to **all Topics** in this work programme, the following seem particularly opportune avenues for the participation of humanities:

SSH.2013.1.2-1. Overcoming youth unemployment in Europe

SSH.2013.2.1-1. Obstacles and prospects for sustainable lifestyles and green economy in Europe

SSH.2013.2.1-2. Social entrepreneurship for innovative and inclusive societies

SSH.2013.2.1-3. The role of multinational companies in addressing global development challenges

SSH.2013.2.1-4. The future of the welfare state

SSH.2013.3.1-1. Addressing European governance of transnational mobility: assessing forms of temporary migration

SSH.2013.3.2-1. Social innovation – empowering people, changing societies?

SSH.2013.3.2-2. Early childhood education and care and the cost of inequities

SSH.2013.3.2-3. The impact of the third sector on socio-economic development in Europe

SSH.2013.4.1-1. Security and democracy in the neighbourhood: the case of the Caucasus

SSH.2013.4.1-2. Facing transition in the South and East Mediterranean area: empowering the young generation

SSH.2013.4.2-1. Media in conflicts and peace building

SSH.2013.4.3-1. EU-India Social Sciences and Humanities Platform

SSH.2013.4.3-2. Transatlantic Social Sciences and Humanities Platform

SSH.2013.5.1-1. Citizens' resilience in times of crisis

SSH.2013.5.1-2. Addressing demand in anti-trafficking efforts and policies

SSH.2013.5.2-1. The multilingual challenge for the European citizen

SSH.2013.5.2-2. Transmitting and benefiting from cultural heritage in Europe

SSH.2013.6.3-1. Towards a European longitudinal childhood and youth survey

¹⁰ The European Union is a party to the OECD declaration on Access to research data from public funding which was adopted in Paris on 30 January 2004.

Ethics

All SSH research proposals that raise ethical issues need to include an Ethics Annex¹¹ in which the ethical dimension of the research should be thoroughly discussed. In drafting this Annex, applicants should take into account the relevant national, EU and international legislation and guidelines, and the FP7 Rules for Submission of proposals. Depending on the nature of the proposal and the type of ethical issues raised, the proposal will undergo an Ethics Screening and/or Ethics Review. The ethical issues most frequently-raised in the area of Social Sciences and Humanities include data protection and privacy (as specified in the Data Protection Directive 95/46/EC) and the terms of involvement of vulnerable populations and children in proposed research. When designing a research proposal, applicants should take into account the rights and principles enshrined in the Charter of Fundamental Rights, including the right to protection of personal data.

¹¹ For details please consult the Guide for Applicants for a given call and funding scheme.

II CONTENT OF CALLS

This section describes all the topics which will be a subject of the calls for proposals in this work programme. This concerns the content of the calls only. For the practical modalities related to these calls, please refer to section III 'Implementation of calls'. For actions not implemented through calls for proposals, please refer to section IV 'Other actions'.

Activity 8.1: Growth, employment and competitiveness in a knowledge society

Rationale

Following the financial and economic crisis there has been sharp increase in unemployment in the EU, especially in those countries which were hit hardest by the financial turmoil and economic slowdown. The situation is particularly difficult for young people as unprecedented numbers of their population remain jobless, which threatens their ability to live an economically and socially independent life. At the same time, European society is ageing rapidly. Growing numbers of pensioners and an increasing dependency ratio will continue to put pressure on public finances which have already been significantly constrained by the crisis. Long-term implications for public expenditures and revenues are still unclear and far-going reforms of public services and social security systems are likely to be necessary. The crisis has also exposed a major weakness in the analytical framework used for macro-economic policy-making, and the workings of the global banking and financial system need to be better integrated into macro models.

Intangible investment is at the heart of an innovative economy and its contribution to productivity growth in the business sector is widely recognised. On the other hand, in the public sector, intangible investments and assets are regarded as expenditures that are not being rightfully recognised as a competitive asset. Due to this, there is an inherent danger that wrongly targeted austerity programmes could undermine long-term growth potential.

Many different forms of innovation are important for smart growth. In this context a lot of attention is being paid to social innovation, even though its economic underpinnings are still largely unexplored.

Area 8.1.1 Changing role of knowledge throughout the economy

Objective

The objective is to develop an understanding of the economic dimensions of social innovation as well as of the importance of intangible investments by the public sector to foster competitiveness and productivity. This will support innovation policies that enhance the Innovation Union flagship and other relevant policy initiatives as part of the Europe 2020 Strategy.

Expected impact

Projects will advance the knowledge base that underpins the formulation and implementation of relevant policies in Europe, with the aim of enhancing the economic perspective on social innovation and ensuring a proper recognition of the role of intangibles in the public sector. Projects will achieve a critical mass of resources in terms of collaboration, networking and mobility of researchers, and will involve relevant communities, stakeholders and practitioners

in the research, with a view to stepping up social innovation and reinforce the role of intangible assets and investments.

Topic for a small or medium-scale focused research project:

SSH.2013.1.1-1 Economic underpinnings of social innovations

Context

Social innovation plays a prominent role in the Europe 2020 strategy. It is an instrument both for empowering citizens and for facilitating the transition towards smart, inclusive and sustainable growth in Europe. Policies that target the recovery from the economic and financial crisis and the social goals within Europe 2020 require the potential of social innovations to be exploited. The Innovation Union Flagship explicitly mentions the social innovations as an opportunity for citizens and businesses to address today's urgent societal challenges in Europe.

Although social innovation has become an important policy instrument, we lack systematic research about how markets, public sector and institutions (including incentives, norms, legal provisions) work for those groups of society which are marginalised and/or in a poor economic position (including the unemployed, the elderly, women, non-educated persons, and young people). A particular question refers to the issue why markets do not function or what institutions are preventing these groups from satisfying their basic needs and changing their social and economic situation. Is it the lack of sufficient income and of access to borrowing, entry costs, lack of education or gender, ethnic and cultural discrimination? How do incentives work, what role does wealth (or the lack of it) play and how can behavioural patterns and characteristics of demand be explained?

Social innovations also differ in one important feature from technology-based innovations, because profits are not necessarily their only driver, especially when based on alternative models for self-financing. Social innovations therefore require alternative business models of financing, distribution and/or employment. Social innovation that addresses the basic societal needs and demands of the most vulnerable may be driven by the public, market or tertiary sector, or by a combination of these and can provide important new employment and business opportunities. Also the user plays a more central role in the innovation process given that the aim is to facilitate empowerment and the responsibility of citizens.

Research dimensions

Research is needed in order to understand what works, how and why it works for economically successful social innovations and how public policy, including the European perspective, can facilitate them:

- Explain how institutions (including incentives, norms, laws), public sector and markets function (or not function) in looking after the poor, marginalised and vulnerable in society and the economy, taking the gender dimension into account;
- Develop stronger concept(s) of social innovation as compared to the economic ones (purely profit-oriented) which are technology based and non-technological innovation models; explaining the differences and similarities between technological and social innovations as well as the specific (economic and social) drivers of and barriers for social innovation;
- The nature and co-evolution of technology-based growth and social innovations to facilitate systemic change; taking stock of the past – successful and less successful -

models providing social innovations (microcredit, mutual self-help, co-operatives) and identifying their economic underpinnings;

- The changing importance of various factors, such as skilled people and creative entrepreneurs and technologies, including networking as well as the relative roles of the State and civil society in the provision of social innovations throughout its life cycle; as well as the scaling up of economic conditions for pilots or prototypes;
- Development of public policy instruments for effective financing and self-financing, public-private partnerships, networks to support social innovations; in particular, identifying what role EU level initiatives and instruments can play in comparison to the Member States and at the regional level;
- Developing indicators to measure social innovations (inputs, outputs) and measuring their contribution to well-being, as well as to smart growth, new economic activities and employment (economic rate of return) across countries and regions by taking into account the development of National Accounts;
- Methods for evaluating the economic and social impact of social innovation initiatives, programmes and policies in European and/or global cross-country comparisons.

Funding scheme: Collaborative project (small or medium-scale focused research project)

Topic for a small or medium-scale focused research project:

SSH.2013.1.1-2 Intangibles in the public sector - an unrecognised source for innovation, well-being and smart growth

Context

The role of intangible investment such as research, innovation, culture or education is at the heart of smart growth and the innovation of the European business sector. There is recognition that the role of public sector intangibles also needs to make progress in terms of their measurement and, therefore, allows us to assess their contribution to the productivity growth of the economy and well-being.

However, we lack a clear understanding and measure of the importance of intangible investment and assets in the public sector, as they are regarded as expenditures. Their contribution to the innovation and growth of the economy, including historical and cultural resources, and their role as a competitive asset of a country and intergenerational well-being are not recognised fully. The structure of public sector expenditure, budget and efficiency are crucial for long-term growth, particularly during a period of fiscal consolidation and austerity. Yet, in the present European economic situation, there is an inherent danger that such public sector investment in intangibles – which is important for long term smart, inclusive and sustainable growth and for the society – are understood merely as a ‘cost and cut’ exercise during austerity policy.

One of the main preliminary steps in this research agenda around the public sector's role in supporting innovation and smart, inclusive and sustainable growth is to arrive at a common understanding of what types of public sector expenditure should be regarded as intangible investment within the meaning of the system of national accounts.

Research dimensions

Research should include the following aspects:

- The role of public sector intangible investment for long-term smart growth by taking the nature and structure of public sector expenditure investment in intangibles into account;
- The role of public sector intangibles for the competitiveness of the business sector as an intangible asset of countries and regions;
- The public sector innovation potential and intangible investment, in particular with respect to the societal challenges and well-being of citizens in an intergenerational perspective;
- Methods of transforming expenditure in intangibles to intangibles investment in the public sector for the purposes of the National accounts methodology and to develop methodologies to improve the collection of data through cross-country comparisons for an economic analysis of the differences between countries;
- New economic analysis of how intangibles contribute to the public sector in the shape of innovation, creativity and economic growth, as well as prosperity, which also covers inclusion and sustainability;
- Empirical analysis of the impact of austerity policies due to the financial, economic and budgetary crisis on public sector intangibles, and therefore on long-run growth and productivity effects, as well as intergenerational well-being.

Funding scheme: Collaborative project (small or medium-scale focused research project)

Area 8.1.2. Structural changes in the European knowledge economy and society

Objective

The objective is to develop a comprehensive understanding of the causes of the very high unemployment among young people and to assess the effectiveness of labour market policies designed to mitigate this phenomenon.

Expected impact

Projects will advance the knowledge base that underpins the formulation and implementation of relevant policies in Europe with the aim of enhancing employment of young people and their transition to economic and social independence. Projects will achieve a critical mass of resources in terms of collaboration, networking and mobility of researchers, and will involve relevant communities, stakeholders, and practitioners in the research, with a view to supporting employment policies in Europe.

Topic for a large scale integrating project:

SSH.2013.1.2-1. Overcoming youth unemployment in Europe

Context

Despite rising levels of overall education and skills, youth unemployment remains high and has been increasing during the period of economic crisis. Indeed, young people are often the first to be affected by downsizing and restructuring measures. With a youth unemployment rate well over 20% (and even above 40% in some Member States), more than 5 million young people in the EU are currently unemployed; this rate is twice as high as for the working population as a whole.

These figures do not even include those young people who are continuing their education because of the lack of available jobs. Moreover, there is growing evidence that young people with a good education have better chances of obtaining a good job, but there are certainly no guarantees of that. Young women, despite high educational achievements, appear to experience even more problems in entering the labour market. Whereas public investments in education and training have been very substantial, it seems that the prospect of more and better jobs still remains a distant dream for many young people. Dual labour markets, with older 'insiders' and younger 'outsiders', raise issues of intergenerational fairness.

According to Eurostat figures, the youth employment rate in Europe dropped to 32.9% in the first quarter of 2011, the lowest value ever recorded in the history of the European Union. Recruitment strategies and decisions by employers are governed by many spoken and unspoken rules, and there is some doubt about the extent to which the expectations and requirements with regard to applicants are always realistic and necessary. Lifting the lid on the black box of supply and demand may provide important insights for both public and private policies, as well as on individual decisions.

This high level of unemployment is a threat to young people individually, since it undermines their self-confidence, economic independence and long-term settling plans, thereby 'scarring' them well beyond the unemployment spells. It also represents a threat to society as a whole, because youth unemployment means missed economic growth, an increase in social inequalities and rising public expenditure. Recently, EUROFOUND¹² has valued the economic cost of young people who are not in employment or education or training (NEETs) at approximately €100 billion (which corresponds to 1% of the aggregated GDP of the 21 countries considered, on the basis of the figures for 2008).

Moreover, in certain parts of Europe rising house prices further limit young people's access to housing, while reductions in pensions undermine the capacities of families to support the young, thereby exacerbating the effect of increased unemployment and underemployment. Thus, the gap between young people and economic institutions, labour markets and societies as a whole appears to be widening. As a result young people need to be empowered and enabled to create an attractive future (or at least a living) for themselves.

At both national and European level, various initiatives are being taken (traineeships, volunteering and mobility) to engage young people as active citizens - providing them with relevant skills, as well as useful semi-formal, non-formal and informal learning. At the same time there is a risk that such schemes might keep young people trapped in such temporary, precarious and low-earning pre-employment regimes, while possibly making the gap even wider in relation to those who are not taking (or unable to take) advantage of these opportunities.

Entrepreneurship is another way of creating jobs and combatting exclusion, and is therefore a key element in achieving the goal of smart, sustainable and inclusive growth set out in the Europe 2020 strategy. However, empirical and analytical work on entrepreneurial activity in Europe (especially by unemployed or vulnerable groups) is fragmented and lacks common frameworks and indicators. Since self-employment may be a decision that is imposed rather than chosen voluntarily, it also entails certain risks for the young person who is starting his or her own business.

Research dimensions

The research should conduct a comparative analysis on the performance of countries and regions, assess previous policy measures and separate out the factors and measures that make a difference. Research should consider the following aspects:

¹² European Foundation for the Improvement of Living and Working Conditions - www.eurofound.europa.eu

- Critically review the mismatch in supply and demand, the reasons and drivers for the low levels of employment among young people, as well as the recruitment strategies and decisions taken by employers;
- Within the cultural context of family organisation, focus on the drivers of youth unemployment and barriers to achieving economic and social independence, and seek to enhance alternative pathways to such independence;
- Analyse the nature and mechanisms of the flexicurity regimes and how they contribute to overcoming youth unemployment, as well as the implications of unemployment in the longer term (regarding healthcare, psychological wellbeing, pensions, etc.);
- Consider the nature, rate and success of business start-ups and self employment, and its social and economic impact, as well as the short-term benefits and risks of particular labour market transition schemes for young people (traineeships, volunteering and mobility, etc.);
- Consider different education and training platforms and their respective implications for labour market selection and exclusion, as well as both knowledge-intensive and low-skilled or differently skilled entries to the labour market or to a professional occupation, including for the most marginalised and vulnerable groups.

With a specific gender awareness and taking the historical and institutional context and the limitations of policy transfer mechanisms into account, the results of this research should provide useful input for policy design and for mutual learning between, and technical assistance to, Member States and Associated Countries in designing and improving relevant schemes and programmes, such as under the European Social Fund.

Funding scheme: Collaborative project (large scale integrated research project)

Area 8.1.3. Strengthening policy coherence and coordination in Europe

Objective

The objective is to understand the long-term impact of population ageing in Europe on public finances and their sustainability as well as to develop analytical tools to effectively integrate the macro and financial aspects of economies.

Expected impact

Projects will advance the knowledge base that underpins the formulation and implementation of relevant policies in Europe with the aim of enhancing effective management of public finances and strengthening macro-economic policy making. Projects will achieve a critical mass of resources in terms of the networking and mobility of researchers, and will involve relevant communities, stakeholders, and practitioners in the research, with a view to supporting the financial and economic sustainability that is crucial to achieving the goals of Europe 2020 Strategy.

Topic for a small or medium-scale focused research project:

SSH.2013.1.3-1 The impact of ageing societies on public finances in Europe

Context

Life expectancy in the EU continues to increase rapidly while fertility rates still remain low. This brings about a very considerable change in the age structure of the European population with a share of persons over 65 in the society rising rapidly. As a result of this trend the median age of the EU population, which is currently estimated at around 41 years, is projected to reach 48 years by the year 2060. The changing age structure is also bringing significant changes in the activity structure of society, with a decreasing share of the working age population expected to double the old-age dependency ratio by 2060. At the same time, especially in the wake of the financial and economic crisis, public finances are under tremendous pressure, with the EU public debt reaching over 80% of GDP, while pension systems in many countries are already, or will soon be, in structural deficit. It is therefore vital to understand how the gradual progress of population ageing will impact on public finances and their sustainability in the long term.

Demography has an influence on government finance both through expenditure and revenue channels. On the one hand, public expenditures are affected, among others, by the activity structure of the population, health care and long-term care costs, as well as the scale of public services. By 2060, age-related expenditure is expected to increase by almost 5 percentage points of GDP overall. On the other hand, the share of population in employment and pension system reforms combined with changing patterns of consumption and investment, all have an impact on the structure of budget revenues. We need to gain a clearer understanding of all these linkages and interdependencies.

Research dimensions

Research should include the following aspects:

- A comprehensive analysis of national public finance systems in the European Union from the perspective of revenues and expenditures structure, as well as an assessment of how the ongoing ageing of the population has changed this structure so far and how it has affected the sustainability of public finances.
- Analysis of the intergenerational dimension of tax systems including how the changing age structure of the society impacts on the distribution of income and wealth across generations, for both women and men, and how it affects public finances and social cohesion.
- Assessment of the long-term impact (over 30-50 years) of population ageing on the structure of budget revenues and expenditures as well as on the sustainability of public finances. This should take into account different scenarios of labour market participation among older age groups.
- Analysis of the necessary reforms of the tax system (both the revenue and expenditure sides), public services and the social security system in order to enhance the long-term sustainability of public finances and, at the same time, ensure social cohesion and intergenerational fairness, as well as an assessment of the broader social and economic implications of these reforms.

Funding scheme: Collaborative project (small or medium-scale focused research project)

Topic for a small or medium-scale focused research project:

SSH.2013.1.3-2 Better integrating financial markets into, policy focussed, macro models

Context

A key societal challenge facing Europe and the world is to better understand the workings of the global banking and financial system. Due to the extent and nature of the crisis provoked by the collapse of Lehman Brothers, policy making with respect to financial markets has been moving very quickly in recent years, with decisions being taken which will have far-reaching economic consequences. In many cases, however, decisions are agreed in a scientific vacuum, with the research agenda in this field often being forced to play catch-up with the policy agenda. It is cause for concern that policy makers still do not have models where the macro and financial aspects of economies are effectively integrated, and that researchers are still unable to decide whether to start this work from scratch, to adapt existing models, or to aggregate the results from detailed micro models. Given this lack of consensus in the academic community, it is clear that fundamental research still needs to be carried out before any attempt is made to integrate these emerging insights into operational macro models. Considerably more research is needed on the most effective ways of introducing financial market imperfections into macro models and towards developing more realistic models of bank behaviour.

In order to successfully meet the challenge posed by the crisis for macro modelling and to address the inadequacies in existing models, the aim of the proposed research work in this area is to build on earlier research efforts, in particular research on relaxing the representative agent assumption. At a more general level, there is a need to explicitly model financial institutions, and not just add them on to existing models. New models must allow for specific shocks in the financial sector and must be able to distinguish between "normal" regimes (i.e. without bubbles and the bursting of bubbles) and "crisis" regimes (where high leverage and high risk-taking leads inevitably to widespread insolvencies which in turn alters the macro context). It is crucial to focus on understanding how and when we move from "normal" to "crisis" regimes as well as deciphering the specific features of the transition period.

Research dimensions

Research needs to explore how to develop new or existing macro models along the following four distinct dimensions:

- Firstly, how such models can effectively allow for temporarily binding credit constraints (or sudden stops in liquidity flows);
- Secondly, how to modify models to allow for bubbles and the interactions of bubbles with financial market constraints;
- Thirdly, more explicit modelling work is needed in order to explore the behaviour of agents under conditions of risk and uncertainty;
- Finally, work must be initiated on explicitly modelling both financial institutions and the key transmission channels / mechanisms via which financial markets shift between "normal" and "crisis" regimes. This work could build on existing research on agent-based modelling (particularly the behaviour of actors on financial markets and systemic risk) and behavioural finance (in particular with regard to expectation formation and herding behaviour).

Research should be relevant for new or existing applied models of macro-economics and financial markets which can be used by policy making institutions, including the Commission.

The research should therefore lead to more credible policy evaluation tools, such as the production of more realistic model simulation exercises, with assessments of specific policy initiatives that are able to take on board the essential insights from current, state-of-the-art, research in finance and macroeconomics.

Funding scheme: Collaborative project (small or medium-scale focused research project)

Activity 8.2: Combining economic, social and environmental objectives in a European perspective

Rationale

The rapid growth in the world population, assisted by ongoing urbanisation and progressing social changes, places an increasing pressure on our planet's natural resources and environment. This calls for a long-term vision of an effective transition to a more sustainable society that will stimulate future growth and contribute to well-being around the globe. The private sector needs to play an important role in this transition, not only by developing new technologies, but also through responsible business practices that support local development and promote long-term economic, social and environmental sustainability.

In Europe, pertinent demographic change and increasing constraints on the public sector present immense challenges to sustainability of the welfare state. This demands a comprehensive analysis of the whole spectrum of social and political changes in Europe that impact on social welfare. In this context, a potentially important role can be played by social enterprises whose primary aim is to generate and maximise social value.

Area 8.2.1 Socio-economic development trajectories

Objective

The objective is to understand the underlying factors, challenges and opportunities linked to the transition to a sustainable society from an economic, social and environmental point of view. Research will analyse the role of the various actors, public and private, taking both the European and the global perspective into account.

Expected impact

Projects will advance the knowledge base that underpins the formulation and implementation of relevant policies to support inclusive and sustainable growth and societies in Europe and, whenever relevant, outside Europe. Projects will achieve a critical mass of resources in terms of collaboration, networking and mobility of researchers, and will involve the relevant communities, stakeholders, and practitioners in research and innovation, in order to reinforce solutions and policies that stimulate the transition to a sustainable society in line with the goals of Europe 2020 Strategy and beyond (cf. European Commission 2050 roadmaps).

Topic for a large-scale integrating project:

SSH.2013.2.1-1 Obstacles and prospects for sustainable lifestyles and green economy in Europe

Context

At world level, environmental pressures and impacts will be exacerbated in the future by an increasing population (expected to rise to at least 9 billion in 2050), urbanization (almost 70% by 2050) and social changes (cf. an additional 1.2 billion people joining the "middle class" population in emerging economies). Future economic growth is expected to be fastest in emerging economies. If this growth is well managed, it will help to lift people out of poverty. However, if the current consumption and production patterns continue, this will increase the

use of natural resources (fossil fuels, water, forests, etc.), accelerate environmental degradation and worsen climate change.

Technology is an important part of the transition to a more sustainable society, but is not the only thing that needs to change. Meeting these global challenges also requires an economic paradigm shift and a change in lifestyles. The move towards sustainable lifestyles and a green economy requires a comprehensive grasp of the nexus between institutional, technological, political, economic and societal factors in order to envisage a new paradigm.

Therefore, key research areas need to address the demand side, re-evaluate current growth models, find ways of accounting for major uncertainties and examine the ways in which new paradigms and new consumer behaviours are likely to develop.

In Europe, although there are many challenges along the road, progress towards achieving sustainability has been made, particularly in terms of making growth more sustainable. The Europe 2020 Strategy calls for smart, sustainable and inclusive growth. Its aim is to transform the EU into a knowledge-based, resource efficient and low-carbon economy.

In line with the "20/20/20" climate/energy targets and the roadmap for a competitive low carbon economy in 2050, Europe needs to develop an economy that is capable of securing growth and development, while at the same time having the capacity to improve human well-being, provide decent jobs, reduce inequalities, tackle poverty and preserve the natural environment. A green economy on those lines involves making use of low-carbon and resource efficient solutions and stepping up efforts to promote sustainable consumption and production, starting with a better understanding of the role and impacts of changes in consumption behaviour and consumer culture. This should be seen not only as a way of reversing negative environmental trends, but also as a vehicle for sustainable lifestyles, new business models, green growth and new jobs.

Research dimensions

Research and innovation dimensions to be taken into consideration:

- Understanding the complex relationships between natural resources, human needs, technology, economics, ecology, and the physical system focusing on consumers' values and behaviour and their consequences on Europe.
- Assessing the short and long-term obstacles and opportunities associated with the transition to European sustainable lifestyles and green economy using qualitative and quantitative methods (scenario analysis and modelling), highlighting the nexus between consumer behaviours, wealth and welfare.
- Investigating new ways and new business models capable of efficiently managing natural resources such as water, energy and food, reducing current levels of consumption and at the same time improving health and quality of life in the EU by analysing, for example, the role of 'Green Public Procurement', marketing for eco-products, cleaner production, greening chains and eco-labelling.
- Measuring the prospects for sustainable lifestyles and the green economy (trends up to 2050) by addressing future demand for services, new ways of consuming, producing, living and moving (cf. role of digital technologies) including the evaluation of the potential of 'distributed systems' in areas such as power generation, water management and manufacturing in their economic, social and cultural components.
- Assessing the political dimensions of this evolution in sustainable lifestyles in Europe, i.e. how such lifestyles can impact on policies and be supported by new kinds of policies and how the evolution of lifestyles is also accompanied by new approaches to social and political life that may also have an impact on political ideas and democratic systems.

This topic has been developed based on the work of the Social Platform on lifestyles (<http://www.sustainable-lifestyles.eu/>).

Specific feature: Projects will be expected to coordinate their activities with the activities of projects selected under the Environment work programme topic ENV.2013.6.2-3 "Transition to sustainable, low-carbon societies".

Funding scheme: Collaborative project (large-scale integrated research project)

Topic for a small or medium-scale focused research project:

SSH.2013.2.1-2. Social entrepreneurship for innovative and inclusive societies

Context

The importance of social entrepreneurship is constantly growing. Surveys have shown that new 'social' start-ups are emerging at a faster rate than more conventional ventures. It is estimated that, currently, social enterprises account for at least 2% of all private enterprises in Europe, while the social economy, of which social enterprises are part, engages more than 11 million employees, or 6% of all employees in Europe. At least one in four newly established enterprises is a social enterprise, this figure rising to one in three in some Member States.

Social entrepreneurship refers to an activity whose primary purpose is to pursue social goals, produce goods and services in a highly entrepreneurial, innovative and efficient manner to generate benefits for society and citizens, use surpluses mainly to achieve social goals, and accomplish its mission through the way in which it involves workers, customers and stakeholders affected by its business activity. The prime objective of social entrepreneurship, therefore, is to generate and maximize social value while remaining economically profitable. Social entrepreneurship is perceived to be a source of new and innovative solutions to the persistent problems of society, as well as a mean to allow a better inclusion of workers and consumers in the Single Market. It is also acknowledged as a major producer or "laboratory" of social innovations, especially at local or community level.

However, social entrepreneurship still suffers from numerous deficiencies – such as poor understanding of its functioning, a bad visibility of its local, domestic and international role, inadequate access to resources and inappropriate legal environments – which prevent it from realising its full potential. Therefore, empirical and theoretical research is needed in order to better understand the conditions under which social entrepreneurship can contribute effectively and efficiently to solving societal challenges in a sustainable way.

Research dimensions

Research should address both the European and the non-European dimension and different sectors or services in a comparative and interdisciplinary manner taking most of the following issues into consideration:

- The extraordinary breadth of their operations and organisational forms of social enterprises makes them difficult to classify. The aim of research is to identify the history of and trends in operations and organisational forms, the role of communities, cultures and traditions, the differing economic relevance of the various organisational forms, and to analyse what these variations mean in terms of national and European policy-making and laws. Research should lead to the establishment of a database of 'good practices'.

- What kind of finance (from fully grant funded to fully self-sufficient) and cooperation strategies do social enterprises embrace in order to increase social impact? How do they improve the social capital market, including "crowd financing" and enhance the capacities of social enterprises to absorb social finance?
- What institutional, political, cultural and economic environments favour the development and survival of social enterprises, their potential for growth, and the sustainability of their activities (in terms of growth, jobs, well-being and the environment)? What role do skills, ethnicity, gender and demography play in developing and scaling-up social entrepreneurship, both domestically and Europe-wide?
- How does social entrepreneurship impact on societal behaviour and behavioural change? To what extent does social entrepreneurship influence consumer-producer relations?
- The proposition that social entrepreneurs play a significant role in producing social innovations should be quantified and qualified, and the process of achieving social innovations should be analysed. Research could include innovation in organisation, management as well as workplace innovation to improve the quality of jobs.
- How can social entrepreneurship be encouraged and fostered in policy-making processes at local, national or European level?

Funding scheme: Collaborative project (small or medium-scale focused research project)

Topic for a small or medium-scale focused research project:

SSH.2013.2.1-3. The role of multinational companies in addressing global development challenges

Context

The beginning of the 21st century was marked by the United Nations Millennium Declaration which spelled out the societal challenges in an increasingly globalised world. It stipulated that every individual has the right to dignity, freedom, equality and a basic standard of living. This involved a global call to all actors to combat poverty and reinforce health care, to promote human rights and encourage tolerance and solidarity as well as, to improve the protection of the natural environment and strive for sustainable economic development.

In order to pursue the ideals set out in the Declaration, to which the EU is strongly committed, an engagement on the part of all actors is needed, including the business sector. In particular, given that large multinational companies have become important economic and political actors influencing both international relations and economic and social development, they play a very significant role in addressing global societal challenges. Therefore, a better understanding is needed of how multinational companies integrate within both the traditional international and domestic environments to create shared value (value for the company itself and its investors as well as for other stakeholders and society at large).

Research dimensions

Research should include the following aspects:

- Developing a comprehensive framework to analyse the impacts of companies in order to assess how they contribute to socio-economic development and well-being, with a particular focus on the areas related to the Millennium Declaration. This needs to include development and use of specific methodologies and tools to measure the

- economic, social, environmental and human rights impacts, both positive and negative, of commercial activities as well as their influence on the governance system at different levels, including combating corruption and promoting business ethics.
- Implementation of at least one small scale-case study of the impacts of companies using the developed framework, involving the relevant actors.
 - Analysis of how international competitiveness and responsible business practices can be mutually reinforcing in a development context and what could be the role of public policy in supporting this.
 - A comprehensive assessment of the consequences of complementarity and non-complementarity of commercial activities with official development aid and operations of civil society organisations.

Collaboration with civil society organisations and other relevant stakeholders is strongly encouraged.

Funding scheme: Collaborative project (small or medium-scale focused research project) for specific cooperation action dedicated to international cooperation

Important: additional eligibility criteria apply to this topic, regarding the participation of targeted ICPC countries from Africa, Asia, Latin America and the Caribbean. These are set out in section III.

Topic for a Coordination and Support Actions (Coordinating) - ERA-NET Plus¹³:

SSH.2013.2.1-4 The future of the welfare state

The aim of this ERA-NET Plus is to pool the necessary financial resources from the participating national (or regional) research programmes and the EU to launch a joint transnational call for proposals in the area of social sciences and humanities research on Welfare Futures. The objective is to assess the pros and cons of the European Welfare State, to develop new approaches to studying the welfare state and to come up with policy options for its future development.

Financing the welfare state of the future is an immense challenge facing all EU Member States, and industrialised countries more broadly. In times of increasingly tight budgets and demographic change, policy-makers need to meet the growing demands of citizens for effective public services, stable employment and career opportunities, as well as an adequate income. Signs of an ongoing process of welfare state reforms have been observed since the beginning of the 1990s.

The transnational call shall address the entire spectrum of social and political change in welfare societies in a comparative way, ranging from the economics of the welfare state, the production of welfare and social innovation, as well as actors and institutions in welfare societies to aspects of individual welfare and social inequality, including the interactions

¹³ 'ERA-Net actions' provide a framework for actors implementing public research programmes to coordinate their activities e.g. by developing joint activities or by mutually supporting joint calls for trans-national proposals. For more information please visit http://ec.europa.eu/research/fp7/index_en.cfm?pg=coordination

between these issues. Research should also cover the formation of new political arenas involving businesses, NGOs, foundations, and social movements and their role in reforming the welfare state.

Expected impact: (i) improve coordination and reduce overlapping in key fields of research; (ii) achieve critical mass and ensure better use of limited resources in fields of mutual interest; (iii) share good practices in implementing research programmes; (iv) promote transnational collaborations and new knowledge generation.

Funding scheme: Coordination and support action (coordinating)

NB: This topic is part of a separate horizontal Call within the ‘Cooperation’ work programme. For details of the Call please refer to the FP7-ERANET-2013-RTD call fiche in Annex 4 to the 2013 ‘Cooperation’ work programme.

Area 8.2.2 Regional, territorial and social cohesion (no topics in 2013)

Activity 8.3: Major trends in society and their implications

Rationale

In order to address societal challenges effectively, it is necessary to take into account the social dimension of innovation. In this context, social innovation promotes participation, empowerment and learning through the active engagement of the citizen, leading to an improved capacity of society to act and innovate. In many parts of Europe, this is reinforced by activities of the third sector, which often address unmet social needs. However, the social and economic impacts of these activities are very difficult to quantify, and reliable data are often scarce.

The prospect of shrinking a work force in the EU as a consequence of ageing population has given rise to discussions about the potential of migration, in its various forms, to counter labour shortages. In this context, different forms of temporary migration and mobility schemes are receiving particular attention because they present substantial governance challenges due to their diversity, complexity and impacts on countries of origin and destination.

The on-going social transformation in Europe, involving more complex family and work arrangements, has led to a substantial increase in the demand for childcare in recent decades. Approaches to early childhood education and care vary significantly from one Member State to another. However, there is still little comparative research on the best working policies and approaches, which makes the development of appropriate systems which reconcile adequate quantity and enhanced quality of services even more challenging.

Area 8.3.1. Demographic changes

Objective

The objective is to understand the underlying factors, challenges and opportunities linked to different forms of temporary migration and mobility patterns, including effective governance and cooperation with third countries.

Expected impact

Projects will advance the knowledge base underpinning the formulation and implementation of relevant policies related to effective governance of temporary migration and mobility at European and national level. Projects will achieve a critical mass of resources in terms of collaboration, networking and mobility of researchers, and will involve relevant communities, stakeholders and practitioners in the research, with a view to improving our understanding of the drivers of temporary forms of mobility and their impacts on all relevant actors, including countries of origin.

Topic for a small or medium-scale focused research project:

SSH.2013.3.1-1. Addressing European governance of temporary migration and mobility to Europe

Context

There has been a considerable expansion in migration and spatial mobility across international borders, both in terms of scale and complexity – a pattern which is expected to continue.

Within the EU, the trends of an ageing population and a shrinking labour force have highlighted the potential for migration to contribute to meeting labour demands in several sectors. Several Member States are already beginning to experience labour shortages in certain sectors and immigration of third-country nationals in a flexible, reactive, responsive manner is being explored as one way to alleviate the situation. Another facet concerns the links with third countries of origin and how such a migration pattern could also be to their benefit. In this context, although a great deal of research has been done on migration, there is a lack of knowledge when it comes to assessing more dynamic, temporary migration and mobility flows across the EU's external borders.

Today, such temporary schemes are most often used in the EU, although they are frequently conceptualised and regulated in different ways in different European countries. Member States are also increasingly coming to acknowledge the need for enhanced cooperation and coordination, particularly with third countries. The EU Global Approach to Migration and Mobility provides a strategic framework in which to develop links with third countries in all aspects of migration. In this context, the issue of temporary transnational migration and mobility from third countries requires an interdisciplinary analysis across a wide range of historical, social, cultural and economic aspects.

Research dimensions

Building on and taking forward previous EU research in the field, the analysis should be conducted from a perspective that is migrant-centred, multi-disciplinary and comparative, both between European countries and with other regions of the world. When addressing this topic, the following research dimensions should be considered:

- Research should look at the governance of current, and possibly new, European and national initiatives and programmes for the temporary migration of third-country nationals to Europe, including via EU mobility partnerships, by assessing their limitations and positive aspects. The development over time of these different instruments, as well as their current and future impacts in the EU and third countries of origin and the coherence - or lack of it - among them, should be assessed. Considering the different definitions and systems of accounting for temporary migration and mobility schemes at EU and national level, research into ways of quantifying them in terms of comparable data and indicators, as well as their impacts on growth and the labour market, is strongly encouraged.
- Research should consider different forms of temporary migration and mobility patterns, which apply to a wide range of third-country nationals, such as seasonal workers, short-term visitors, researchers, tourists, intra-corporate transfers, etc. In particular, the specific nature of seasonal labour as a form of temporary or circular migration, including in the field of agriculture, should be taken into account. Research should contribute to assessing the trend, type and significance of seasonal migration of third-country nationals, by outlining the risks and benefits of existing schemes, legislation and practices, including from the perspective of third countries of origin. In addition, parallels could be drawn between similar forms of temporary mobility from outside and within the EU, looking in particular at their impacts on host Member States and countries of origin and on EU growth more generally.
- The analysis should identify the main drivers of different temporary forms of mobility for individuals and their subsequent migratory patterns, thereby contributing to the understanding of their social, cultural and historical dimensions. Existing studies provide conflicting accounts. For example, they stress that circular migration seems to rarely benefit those who migrate on the one hand, but also point to migrants' preferences for flexible and circular mobility schemes on the other. At the same time, there is

evidence to show that intolerable exploitation and human rights violations of seasonal workers or other temporary migrants can take place not just in the countries of destination, but also in countries of origin and transit. Research should contribute to clarifying these dynamics, including from a gender perspective, considering for example the role and impact of different actors – local and national institutions, migrants, host populations, etc. - and different factors, including degrees of flexibility in conditions of entry, stay and return; labour conditions; education and training opportunities for migrants in destination countries; skills and qualifications; possibilities for family reunification; working and living conditions in sending countries; the role of transnational networks, etc.

Funding scheme: Collaborative project (small or medium-scale focused research project)

Area 8.3.2. Societal trends and lifestyles

Objective

The objective is to understand modern societal trends and their impact on socio-economic development in Europe. In particular, research should conceptualise the value of social innovation as a driver of growth, social cohesion and participation as well as the role of the third sector.

Expected impact

Projects will advance the knowledge base that underpins the formulation and implementation of relevant policies enhancing the sustainable impact of social innovation, as well as ensuring the appropriate quantity and quality of pre-school education. Projects will achieve a critical mass of resources in terms of collaboration, networking and mobility of researchers, and will involve relevant communities, stakeholders, and practitioners in the research, with a view to reinforcing inclusive and sustainable growth in line with the goals of the Europe 2020 Strategy and the Innovation Union flagship.

Topic for a large-scale integrating project:

SSH.2013.3.2-1. Social Innovation – empowering people, changing societies?

Context

Societies around the world are facing many of the same challenges, which are exacerbated by the economic and financial crisis. These challenges include, for example, tackling inequalities and demographic change, securing food, water and energy supply, combatting climate change and poverty, and improving the quality of life and employment. Moreover, the mounting costs of providing public services require major reforms of these services and greater government efficiency. However, the traditional ways in which the market, the state and the civil sector have responded to societal demands are no longer sufficient as technological progress and technological innovation reveal limitations when it comes to resolving pressing societal challenges alone.

Therefore, for most societal challenges, social innovations need to be taken into account, referring to changes in (production and consumption) habits, discourses, behaviour and values, strategies and policies, as well as organisational structures, processes, services and

participation patterns. Through its process dimension, e.g. the active engagement of the citizen, social innovation is said to contribute to reshaping society in the direction of participation, empowerment and learning. Consequently, social innovation is not only responding to social needs and addressing societal challenges but also has the potential to improve society's capacity to act and innovate with a view to achieving systemic change.

However, there is still no sustained and systematic analysis of social innovation, its theories, characteristics and impacts, and this has led to social innovation being developed through a "bottom-up process" with little conceptualisation of the political-institutional environments needed for propelling social innovation, its economic, social and cultural values, the conditions for its sustainability and diffusion, and the roles of the actors and institutions involved. Therefore, the objectives of the research should be to elaborate a common understanding of social innovation, to understand how and under what conditions social innovation leads to change in existing structures, policies, institutions and behaviour, and to identify and assess the factors that are crucial for social innovation to have a sustainable social impact and to be scaled-up.

This topic is particularly suited to comparative and multidisciplinary research, and shall address both the European and the non-European dimension by covering an appropriate number of countries and a wide range of policy areas (such as energy, environment/climate change, health, water and food supply, mobility/transport, finance, development, employment, education, youth, family, social policies, etc.).

Research dimensions

Research should address most of the following issues:

- Cultural, religious and historical contexts should be considered through a comparative analysis of different practices and systems of social innovation across different world regions, with a view to elaborating a general theory of social innovation and to conceptualising and defining the value of the field as a driver for growth, social cohesion and political participation.
- Explore testable hypotheses regarding the conditions under which social innovations may have a sustainable social impact, and identify critical success factors at each stage of the social innovation cycle. There is a need to understand what is the actual role of social innovation for societal transformations and sustainable systemic change, including in times of economic crisis, as compared to technological innovation.
- Gaining a better understanding of the link between social innovation and behavioural change, between social innovation and participatory processes, the role of gender diversity and equality, skills and leadership for the development and implementation of social innovations, and of how creativity and arts trigger social innovation.
- In order to better understand how to scale-up social innovations and enhance their impact, there is a need for research on the diffusion processes of social innovations within and between countries as well as the analysis of critical points related to funding (including from the Structural Funds). In this context, the opportunities and risks of social media for enabling and diffusing social innovations need to be better understood.
- A crucial factor for the success for social innovation is the emergence of innovation networks in which the different groups of actors strike out along new paths in social change as part of an interactive process. How can such networks be identified, developed, supported and sustained? What is the specific role of the various actors involved? What role do networks play across different policy areas and countries? How do these interactive processes work and what practices make them successful ('good practices')?

- Activities should lead to methods and tools for developing social innovation experimentation and incubation.
- Participation by non-European partners is encouraged.

Funding scheme: Collaborative project (large-scale integrating research project)

Topic for a small or medium-scale focused research project:

SSH.2013.3.2-2. Early childhood education and care: promoting quality for individual, social and economic benefits

Context

Investing in quality early childhood education and care¹⁴ (ECEC) is crucial, as it is at this stage that the foundations are laid for subsequent learning and achievements, and also because it is shown to contribute to breaking the cycle of disadvantage. Within the EU, there are significant variations between Member States as regards enrolment rates, supply, quality, resources, approach and governance of ECEC. Until a few years ago, the focus of most EU level action was on providing more childcare places to enable parents (mainly mothers) to (re)join the labour market. However, in recent years the quality of ECEC provision has started to feature on the policy agenda in many Member States, and Ministers have repeatedly expressed their wish to cooperate at European level in this area.¹⁵

The Commission's Communication on ECEC, adopted in February 2011¹⁶, sets out key policy areas for cooperation within the Open Method of Cooperation in order to improve the accessibility and quality of ECEC across Europe. It calls for well-integrated services that build on a joint vision of ECEC, for effective curricular frameworks and for the staff competences and governance arrangements necessary to deliver that vision. In May 2011, the Education Council adopted Conclusions which supported the Commission's analysis of future priorities for joint policy work.¹⁷

While there appears to be a broad consensus on the importance of ECEC, most of the evidence on which policy is based comes from the English-speaking world. Research is therefore needed which takes account of the heterogeneous nature of ECEC in a broader European context.

Taking the existing data sources into account, there is a need for interdisciplinary collaborative research (both quantitative and qualitative) on ECEC in order to enhance our prospects in relation to various aspects of this topic and to support policy development and implementation. Comparative as well as longitudinal research that would include the collection of comparable data across all Member States would be very useful in this context.

Research dimensions

The research should address key issues and questions related to policy measures that are effective in:

¹⁴ Given the wide variety of services across Europe we understand under the term *early childhood education and care* any arrangements providing education and care for children from birth to compulsory school age - regardless of the setting, funding, opening hours, or programme content - and including pre-school and pre-primary provision. OECD, *Starting Strong I* (2006), p. 7

¹⁵ Most recently Council Conclusions on a strategic framework for European cooperation in education and training (ET 2020) (OJ C 119 of 28.5.2009)

¹⁶ COM(2011)66 of 17 February 2011.

¹⁷ <http://register.consilium.europa.eu/pdf/en/11/st09/st09424.en11.pdf>

- Widening access to ECEC for disadvantaged children, and overcoming obstacles (including cultural) to participation in ECEC, as well as the advantages and impact of universal versus targeted provision with a particular focus on vulnerable groups;
- Optimising ECEC effectiveness – which aspects of quality matter the most in terms of making ECEC services efficient?
- Curriculum design for early childhood education and care;
- Professionalization of staff; attracting, educating, up-skilling and retaining high quality staff; staff competences, including the ability to deal with diverse and special needs, early diagnosis/alert system for disorders, social or physical problems etc.;
- Assessing the impact (short-, medium- and long-term) of ECEC (and particularly ECEC quality) on all children including the disadvantaged; measuring outcomes, including non-cognitive outcomes, with special regard to their cognitive (including basic skills), social, emotional and cognitive development. This should also include meta-analysis of existing European longitudinal studies, as well as European cost-benefit analysis;
- Monitoring and quality assurance of ECEC, including governance structures and system accountability, and coordination and synergy with other policies;
- Funding ECEC, including the balance of public and private investment, system efficiency and quality and social equity – who is being served by the ECEC services;
- The development of innovative European indicators for children's well-being in ECEC.

Funding scheme: Collaborative project (small or medium-scale focused research projects)

Topic for a small or medium-scale focused research project:

SSH.2013.3.2-3. The impact of the third sector on socio-economic development in Europe

Context

In many parts of Europe, the third sector, which embraces the activities of organizations that are not-for-profit and non-governmental, has a long history of social and economic significance. One reason for its importance has been the growing number of organizations operating in the sector, and the ever-widening scope of their activities. In some countries, like Belgium or the Netherlands, it is estimated that the third sector currently represents about 10% of total employment. Another possible reason for this is that the sector is often perceived as the source of qualitative advances in socio-economic governance, fostering novel forms of organisation and interactions that address societal needs that have been hitherto unmet in areas such as health care, education, consumer protection or the environment. As a motor of social innovation, it therefore regularly fills the space between the market (first sector) and governmental institutions (second sector), promoting values such as justice and solidarity, while bringing practical advances in the areas of social inclusion and integration. This latter virtue is particularly visible in the field of volunteering, i.e. the formal or informal actions carried out by a (group of) person(s) on a voluntary basis and without any financial gain. Apart from those who make their living through employment in the third sector, around one in three Europeans contributes through voluntary activities.

While research has produced sound empirical insights into the manifold types of entities and activities that co-exist in the third sector, there remains a kind of conceptual ambiguity, especially as a result of the rapidly changing nature of the subject of study. Trends such as increased professionalization in some parts of the sector or the emergence of novel forms of

activities (e.g. "e-volunteering") develop alongside traditional third-sector activities. As a result, it is at times difficult to identify what can be considered as a third-sector activity, and how to study this activity and assess its impact in and on society. Differences in cultural models and traditions across Europe add a further layer of complexity. Lack of understanding, in turn, complicates the design of legislation and policies that create the framework for third-sector operations. The aim of the research conducted under this topic is therefore to further advance our understanding and develop the potential of the third sector in socio-economic terms, with a particular emphasis on volunteering.

Research dimensions

Studies should address the following issues:

- What are the long-term developmental trends of third sector activities in Europe? What forms do these activities take, what purposes do they fulfil? Stock-taking presupposes conceptual clarifications, possibly from an historical perspective, on what the third sector entails. It should result in classifications derived from cross-country, cross-cultural, cross-regional and cross-sector comparisons.
- What are the cultural, social and economic impacts of the third sector? The propositions that it presents high single-digit percentage contributions to the GDP of many states in the EU need to be underpinned by valid data, distinguishing between regions in Europe. Moreover, it needs to be clear how the economic and social value and contribution to welfare of volunteering, for instance, can be reliably measured.
- Moreover, research should engage in the development of methods and subsequent implementation of ex-post evaluations of activities in the third sector with the aim of precisely identifying their contribution to society in a broad and long-term perspective. This involves investigating not only what the activities produce in terms of the general purpose they serve (macro-perspective), but also their impact on those working in the sector as employees or volunteers (micro-perspective). What do these people gain from it, how are their skills developed? In short, what social capital do third-sector operations generate?
- Research should look into the reasons for both successful and failed third-sector activities. First, what are the enabling factors and what are the conditions that hinder engagement in the third sector, notably in volunteering, at the individual and organisational levels? Second, what accounts for their impact on society: under what conditions does an activity yield economic or social returns, and when does it not?
- Lastly, there is a need to identify the necessary legal and political actions - at EU, national and sub-national levels – that flow from these findings: what type of governance infrastructures need to be created in order to derive maximum benefit from the third sector?

The topic is particularly suited to collaborative ventures between the socio-economic sciences and humanities, and therefore the analyses should combine perspectives from different disciplines. Research should embrace a resolutely comparative approach, covering a sufficient number of countries that reflect the diversity of the cultural traditions that co-exist in Europe. It could also include comparisons between EU and third countries. Finally, research may benefit by including non-profit organisations engaged in third-sector activities of all types.

Funding scheme: Collaborative project (small or medium-scale focused research projects)

Area 8.3.3. Cultural interactions in an international perspective (no topics in 2013)

Activity 8.4: Europe in the world

Rationale

Recent decades have shown that socio-economic transformation is a complex and difficult process which creates not only major opportunities, but also manifold challenges. Instability in the Caucasus region, further exacerbated by the 2008 conflict in Georgia, has been one major source of concern in a region that has significant strategic importance in areas such as energy security and trade. In a similar vein, some countries in the South and East Mediterranean area have recently experienced revolutions, which have raised questions about their impact on the process of political, economic and social transformations, while at the same time echoing concerns about stability in this area.

Another cross-cutting issue of major importance in the prevention and management of violent conflicts within and between societies is the impact of rapid and continuous changes in the media. New media developments have a significant impact on societies and on the way in which individuals interact, particularly in cases of violent confrontations and limits on personal freedom. Interdisciplinary research will help in clarifying the role and influence of new and traditional media in situations of conflict, peace enforcement and peace-building.

International trade and cross-border investment are an important part of achieving the goals of Europe 2020 Strategy. However, the ability to design and implement sound trade policy suffers from a serious lack of knowledge about how trade in services, goods and investment are affected by the various regulatory environments across countries and sectors.

In order to advance the development of the European Research Area, the EU's international cooperation in social sciences and humanities needs to be enhanced. Reinforcing the networking of research activities and communicating with its main EU partners on findings and research priorities is crucial in this context.

Area 8.4.1. Interactions and interdependences between world regions and their implications

Objective

The main aim is to foster understanding of the driving forces behind global interactions and interdependencies, of the relationships between world regions and the factors favouring democracy, peace and human rights in a forward-looking perspective seeking to explore prospects for Europe in a multi-polar world.

Expected impact

Projects will advance the knowledge base that underpins the formulation and implementation of policies concerning the EU's relationships with other regions. They will achieve a critical mass of resources and involve relevant communities, stakeholders and researchers in the countries concerned, with a view to exploring the reshaping of geo-political relations in areas of strategic importance for the EU, such as the Caucasus and the South and East Mediterranean.

Topic for a small or medium-scale focused research project:

SSH.2013.4.1-1. Security and democracy in the neighbourhood: the case of the Caucasus

The context

Instability in the Caucasus has been a major source of concern for actors in the wider Eurasian region, including the European Union, as was aptly illustrated by the 2008 conflict in Georgia and the related EU monitoring mission. 'Protracted conflicts' and other security risks are not just the product of geopolitics and cultural-historical divergences, however, but result also from the co-existence of multiple intra-societal problems in the Caucasian and neighbouring regions. These problems include deficient democratic institutions, religious, cultural and linguistic divisions, weak civil society actors, poverty and corruption. Effectively addressing these challenges is an important prerequisite for improving the living conditions of the populations in the Caucasus, as well as for capitalizing on the region's significant strategic potential, be it in terms of energy security, trade or combating trans-border crime. For the EU, the countries of the South Caucasus - Georgia, Armenia and Azerbaijan - are partners in the framework of the EU's Eastern Partnership, whereas the Northern Caucasus - with entities such as Chechnya, Dagestan and Ingushetia - forms part of the Russian Federation, one of the EU's strategic partnership countries. A deeper understanding not only of the security problems and their root causes, but also of the potential for democratization in the region, will help the EU to take forward its strategy vis-à-vis the Caucasus and consolidate the relations with this major neighbourhood area in the medium-to-long term.

Research dimensions

Research should include the following aspects:

- While opinions differ as to whether the Caucasus can be regarded as a homogenous region, there is nevertheless a common historical heritage and deeply intertwined conflicts that relate the North and the South. Research should therefore try to look into the region as a whole, taking into consideration the broader geopolitical context in which it is embedded. This involves examining - where appropriate - other regional powers in its neighbourhood (e.g. actors in the Caspian and Black Sea basins and Central Asia, Russia, Iran, Turkey), as well as the impact of regional and international organisations and ongoing processes of international negotiation, such as the Geneva talks, shifting borders and migration within the region.
- Studies should identify the roots of conflicts and insecurity by exploring not only this context, but also the numerous intra-societal challenges that exist within the different Caucasian countries. Issues that could be examined include the role of the State and the media, religious practices and institutions, linguistic and cultural divides, socio-economic conditions or the potential of civil society actors to promote democracy, human rights, the rule of law and the fight against corruption, also from an historical, sociological or anthropological perspective. Special attention could be devoted to the link between intra-State democratization and regional security, including energy security. Moreover, research can help in adopting a forward-looking perspective, by mapping emerging 'hot spots' in the region.
- The implications of the findings for the design of effective policies to cope with insecurity in the area should be given prominence. In this context, both the perceptions and the actual and potential roles of the EU - as a new institutional actor in the dense strategic environment of the Caucasus - should be examined.
- Research projects should embrace a strong interdisciplinary approach and rely on comparisons between different countries from the region, but they could also carry out

comparisons with third countries. They should involve partners from at least two different countries from the Caucasus. An even broader participation of actors from various countries of the region is strongly encouraged.

Funding scheme: Collaborative project (small or medium-scale focused research project) for specific cooperation action dedicated to international cooperation

Important: additional eligibility criteria apply to this topic regarding the participation of targeted ICPC countries from the Caucasus region. These criteria are set out in section III.

Topic for a small or medium-scale focused research project:

SSH.2013.4.1-2. Facing transition in the South and East Mediterranean area: empowering the young generation

Context

The South and East Mediterranean (SEMC) area extends from Morocco in the South-West to Turkey in the East. Currently this region is inhabited by nearly 300 million people, with one of the youngest age profiles in the world, as around half of the population is under 25. By 2030, the population of these countries will have increased by some 25% to around 370 million, while the working age population will have risen by some 50 millions.

The recent popular revolts in some SEMC countries have pushed the region into a process of major political, economic and social transformations, the effects of which will extend beyond the Mediterranean region. In the context of globalisation, there are growing expectations and needs on the part of the citizens, especially the young, whose opportunities for personal development are currently very limited in many cases, particularly in the case of women. Continued demographic growth and rapid urbanisation will put even greater pressure on the emerging economic systems, which will need to provide more jobs, ensure social well-being and increase social cohesion in order to empower the young generation to become a driving force of socio-economic development and agents of social and cultural change.

Research dimensions

Research should include the following:

- An assessment of applicability and relevance of other experiences of socio-economic transformation in Europe and elsewhere in the world to address the challenges facing the South and East Mediterranean region in relation to managing economic, political and social change.
- Analysis of the underlying causes of youth unemployment, including among the highly educated, as well as education and market skills requirements in the region in order to address the challenge of creating better development opportunities for young people, with a particular focus on women.
- Assessment of the economic prospects for young people, especially in marginalised and poor areas, and how to promote greater social inclusion and engagement.
- Assessment of the political role of young people and their integration into new political and economic transformations in the region. Particular focus should be placed on the difficulties that young people, especially women, are finding in the transformation

processes, and on the cases in which these difficulties have been overcome through the empowerment of social movements.

- Analysis of the nature and context of changes in social values and norms of young men and women in relation to family, politics, participation and religion and how the young generation can drive new cultural trends via new communication channels, including the impact of social media on youth empowerment and sustaining social movements.

Funding scheme: Collaborative project (small or medium-scale focused research projects) for specific cooperation action dedicated to international cooperation

Important: additional eligibility criteria apply to this topic regarding the participation of targeted ICPC countries from the South and East Mediterranean area. These criteria are set out in section III.

Area 8.4.2. Conflicts, peace and human rights

Objective

The objective is to clarify the role of new and traditional media in conflicts and peace-building with a view to assisting conflict prevention and crisis management. Cooperation between European teams and researchers from outside Europe is strongly encouraged, where relevant.

Expected impact

Research will advance knowledge of the role of the media in conflict prevention and crisis management in support of the formulation and implementation of policies by the EU and its international partners. Projects will achieve a critical mass of resources and involve relevant communities, stakeholders and practitioners in the research, with a view to integrating insights from them into both the empirical and the theoretical inquiry. This will also enhance the dissemination of research results both in Europe and in other locations involved in projects.

Topic for a small or medium-scale focused research project:

SSH.2013.4.2-1. Media in conflicts and peace building

Context

Media (from global TV channels and press agencies to local journals or radio stations, to the spectacular rise of social media) can play a crucial role both in fuelling conflicts and in mitigating them, by giving a voice to democratization constituencies and peace groups, or to xenophobic and populist ones, as well as assisting in crisis management and peace-building. While the huge role of the media in diffusing information at the global level and in influencing political perceptions and societal behaviour is widely acknowledged, and while violence and wars are among the 'best selling' news, the specific and complex role of different types of media in conflict transformation and peace processes deserves deeper analysis. Such analysis can help to provide a better understanding of both the roots and impacts of conflicts, and of the working of media in situations of crisis and polarization, when the framing of information and access to it has even a more acute impact than in other situations. Research

that draws on critical thinking around media and conflicts, and builds on the inputs of a range of different social actors, can help to inform peace-building practices on the ground, in addition to fostering a better understanding of conflicts.

The EU is involved in conflict resolution, crisis management, humanitarian assistance and peace-building efforts in its neighbourhood and far beyond. Such involvement is also likely to increase as a result of enhanced EU powers in the area of Common Foreign and Security Policy following the adoption of the Lisbon Treaty. Working with media is a key component of such efforts – from contacts by policy makers and operational personnel (civilian and military) with media professionals, to the support of community media in conflict resolution and in reconstruction projects. In addition, Europe-based media are evolving in their coverage (or lack of it) of different areas of the world, and this can also influence whether and how EU action in such areas is communicated outside the circle of those directly involved.

The media can play a crucial role both in fuelling conflicts and in mitigating them, as well as assisting in crisis management and peace-building, including by the way in which they represent and interpret historical narratives. This has become apparent in various conflicts in different regions – from the civil war in former Yugoslavia to the genocide in Rwanda and many other conflicts ranging from Afghanistan to Sri Lanka. Media – especially social media – also play a pivotal role in providing not only visibility, but also the means of action to social movements advocating the end of authoritarian regimes, as in Iran or the Arab uprising.

Research dimensions

Research should include the following aspects:

- Research should address the role of the different types of media – including global and local media (TV, press, radio) and social media – in the cycle of conflict, from escalation to post-conflict reconstruction and peace-building. Issues such as the dissemination of hate-messages or, on the contrary, the development of information exchanges between communities in conflict, could be part of such an analysis.
- Research should also examine the relations between media and political elites, between media and business, and between media and the military (e.g. embedded reporting) in the countries/societies in conflict, as well as the media's relations with NGOs – both at international and at grass-roots level – with EU institutions and with international organizations.
- The role of traditional and new forms of media when it comes to assisting in crisis management and implementing peace agreements, should be assessed, as well as their role in assisting or stigmatizing victims of war or genocide.
- Consideration could also be given to the role of investigative journalism and war-reporting in terms of 'early warning' and in shaping public perceptions of the significance and urgency of conflicts.

Funding scheme: Collaborative project (small or medium-scale focused research project)

Area 8.4.3 Europe's changing role in the world

Objective

The aim of the Social Sciences and Humanities Platforms is to complement the existing bilateral and other multilateral activities carried out by EU Member States and Associated Countries with India, Canada, the USA, Mexico and Brazil. Research will also advance the

understanding of non-tariff measures in international trade with a view to improving the efficiency of European trade policy in the area of services.

Expected impact

The expected impacts of Platforms range from favouring cooperation based on mutual interest and benefit by bridging gaps between research programmes and activities and reinforcing dialogue in the cross-cutting areas of social sciences and humanities, on the one hand, to achieving a critical mass and a better use of available resources and join forces to provide common answers to common problems on the other. The activities will therefore help to underpin a process of informed decision-making.

Research will advance the state of knowledge on non-tariff barriers and their role in trade policies. Projects will achieve a critical mass of resources in terms of collaboration, networking and mobility of researchers, and will involve relevant communities, stakeholders and practitioners in such research, with a view to incorporating their insights into both empirical and theoretical inquiry.

Topic for a coordination and support action (supporting):

SSH.2013.4.3-1. EU-India Social Sciences and Humanities Platform

India has a longstanding, significant tradition of research and scientific capacity, which includes a huge 'talent pool' and worldwide diaspora networks in the field of social sciences and humanities. India's development and increased relevance on the international stage has made it a strategic partner for the European Union, thereby enhancing the need to strengthen mutual knowledge and understanding.

In order to encourage effective, structured and coherent international scientific cooperation in the social sciences and humanities at global level, closer cooperation between national programmes of Member States, Associated Countries and international partner countries is essential in order to fulfil the commitments that were made to complete the European Research Area.

The aims of the EU-India Social Sciences and Humanities Platform are to:

- step up international cooperation between research programmes through the networking of those programmes and a closer coordination of activities;
- enhance the networking of on-going research projects run both by the EU and India in the area of social sciences and humanities;
- strengthen the production, use and communication of research activities and findings in areas of relevance for all partners involved;
- support mechanisms whereby national social science and humanities research funding organisations of India, the Member States and the Associated Countries can join forces in order to develop multi-disciplinary, wide-range solutions to tackle global societal challenges.

The following specific activities can be pursued via the Platform:

- the organisation of brokerage events to enhance the networking of on-going research projects from each programme, sharing of best practices, and discussing prospects for cooperation;
- information and awareness activities by bringing together researchers and various stakeholders, including civil society organisations, citizens' groups, private actors, policy-makers, and other networks;

- the organisation of events aimed at identifying priorities for collaboration and enhancing the quality, quantity and visibility of future actions, including the possible formulation of joint research agendas;
- provision of assistance in forming research partnerships and in identifying suitable research partners.

This call is addressed in particular to programme "managers", such as research councils or funding agencies, or other national or regional organisations that implement social sciences and humanities research programmes in EU Member States, Associated Countries, and India.

Funding scheme: Coordination and Support Action (supporting)

Topic for a coordination and support action (supporting):

SSH.2013.4.3-2. Transatlantic Social Sciences and Humanities Platform

The EU and countries in the Americas are increasingly connected by an intensified level of interaction and common challenges. Economic flows and social linkages are growing on both sides of the Atlantic. While collaboration between the EU and North America in the area of research has a long tradition and is firmly developed, the increased relevance of countries in Latin America on the international scene is turning them more and more into a strategic partner for the European Union, thus enhancing the need to strengthen mutual understanding, as well as promoting the joint identification, setting up, implementation and monitoring of mutual interests and joint priorities.

In order to encourage effective, structured and coherent international scientific cooperation in the social sciences and humanities at a global level, closer cooperation between the national programmes of Member States, Associated Countries and international partner countries is essential in order to fulfil the commitments made to complete the European Research Area.

The Transatlantic Social Sciences and Humanities Platform should:

- step up international cooperation between research programmes through the networking of those programmes and closer coordination of activities;
- enhance the networking of on-going research projects run by both the EU and those partner countries that are addressed by this call in the area of social sciences and humanities;
- strengthen the production, use and communication of research activities and findings in areas of relevance for all partners involved.

The following specific activities may be pursued through the Platform:

- the organisation of brokerage events to enhance the networking of on-going research projects from each programme, sharing of best practices, and discussing prospects for cooperation;
- information and awareness activities by bringing together researchers and various stakeholders, including civil society organisations, citizens' groups, private actors, policy-makers, and other networks;
- the holding of events aimed at identifying priorities for collaboration and enhancing the quality, quantity and visibility of future actions, including the possible formulation of joint research agendas;
- provision of assistance in forming research partnerships and in identifying suitable research partners.

This call is addressed in particular to programme "managers", such as research councils or funding agencies, or other national or regional organisations that implement research programmes in the areas of social sciences and humanities in the EU Member States, Associated Countries, Canada, the USA, Mexico and Brazil.

Funding scheme: Coordination and Support Action (supporting)

Topic for a small or medium-scale focused research project:

SSH.2013.4.3-3. Untapped potential for growth and employment – reducing the cost of non-tariff measures in goods, services and investment

Context

The Europe 2020 Strategy is key in responding to Europe's needs in terms of jobs, growth and well-being of citizens. International trade in goods and services and cross-border investment stand out in terms of their contribution to the Europe 2020 strategic goals in Europe and at world level. However, the ability to design and implement a sound trade policy is hampered by a substantial lack of knowledge about how trade and investment are affected by the different regulatory environments across countries and sectors. There is also very little knowledge about how policy can best address country specific regulations for more trade and innovation to bring about smart, sustainable and inclusive growth in Europe and the world.

Developing knowledge and policies on supporting trade and cross-border investment by reducing the cost of non-tariff measures (NTMs) is all the more crucial in the medium term, while acknowledging that NTMs can have both discriminating and welfare-improving effects, and exhibit major differences across sectors. A better understanding of the differing nature of NTMs and their impacts serves to achieve the European and worldwide objectives for supporting smart growth, i.e. growth that is knowledge based, inclusive and sustainable.

Faced with these knowledge gaps, even advanced policy modelling tools work on the basis of simplified assumptions that can easily lead to sub-optimal information content. Therefore, we need to gain a better understanding of the nature of and solutions to the diversity of NTMs in terms of influencing trade and investment flows.

Research dimensions

Research should address the following issues by taking the European perspective with respect to trade between the EU and its partners, in particular the big and emerging partners:

- Collecting qualitative information on the regulatory measures that influence cross-border trade in goods and services and investment, and developing methodologies to quantify that information in order to allow a quantitative and qualitative analysis of their effects on growth, innovation, well-being, environment and inclusiveness;
- Developing a common conceptual understanding of NTMs with respect to trade (services and goods) and cross-border investment by taking into account, inter alia, their relationship with other policy objectives such as health, well-being, the environment and intellectual property rights;
- Mapping data availability by assessing the gaps in the scope, quality and coverage of existing official and unofficial sources, as well as analysing potential unofficial sources; looking for opportunities to improve the comparative quality of data, and/or to connect

existing data by building on earlier efforts, including the EUKLEMS and WIOD databases;

- Analysing the impact that reduced or modified NTMs have on trade and investment on the European economic and social objectives in the context of Europe 2020 concerning employment, smart, inclusive and sustainable growth as well as from the global perspective of reducing poverty and increasing quality of life.

Funding scheme: Collaborative project (small or medium-scale focused research project)

Activity 8.5: The Citizen in the European Union

Rationale

Diversity of cultures and languages in the EU has been growing as European integration has widened and also as a result of global trends such as trade, increased mobility and advances in technology. As a result, proficiency in more than one language has become an important comparative advantage which has a significant impact on the professional and personal opportunities that the EU can offer. Conversely, a lack of multilingual skills can reduce employability and increase the risk that poverty and social exclusion may possibly have an adverse impact on the EU's economic performance, and lead to broader political and social repercussions. At the same time, increasing cultural diversity has enriched the European cultural heritage, presenting challenges in terms of how to preserve and transmit that diversity, but also creating opportunities related to its potential to stimulate innovative growth and jobs.

Human behaviour is a crucial factor when dealing with any public policy challenge, be it overcoming an economic, social or political crisis or successfully fighting crime. Crisis situations, depending on their nature, can impact citizens' rights to a different extent and under different conditions. The way in which crises are handled can also affect the legitimacy of the public authorities in the eyes of the citizens. Thus, understanding how citizens claim and enact their rights and how they develop resilience in difficult times is crucial for both the EU and its Member States. The trafficking of human beings is a complex and constantly evolving phenomenon. As a crime and a grave violation of human rights, it is profitable in part because of the demand for cheap goods and services which fosters an environment where people are exploited for profit. It is therefore crucial that a comprehensive assessment be made of the current efforts and approaches to reducing this demand and exploring ways of further enhancing their effectiveness.

Area 8.5.1. Participation and citizenship in Europe

Objective

The main objective is to analyse human behaviour in times of crisis and the manner in which citizens develop their resilience and exercise their rights, as well as to acquire a better understanding of how public policies can enhance the efforts being made to reduce the demand for trafficked services.

Expected Impact

Research will advance the knowledge base on the effects of crisis situations on citizens' rights and their resilience with a view to reinforcing rights protection in all policies concerned and helping to prevent potential disengagement and the rise of populism. Research will also strengthen efforts and policies to reduce demand in the context of addressing trafficking in human beings. Projects will achieve a critical mass of resources and involve relevant communities, stakeholders and practitioners, with a view to integrating their insights into both the empirical and theoretical inquiry.

Topic for a small or medium-scale focused research project:

SSH.2013.5.1-1. Citizens' resilience in times of crisis

Context

EU States, as the primary bearers of rights obligations, are required under national, European and international law to respect, protect and fulfil the rights of EU and non-EU citizens who are resident on their territory. One of the tests of how rights are actually being exercised and whether certain rights may not be sufficiently protected or adequately enforced is what happens in times of 'crisis'. Such crises may take different forms, e.g. economic and financial crisis impinging on a number of the civil, economic and social rights of citizens; political crises that affect various rights - from representation to access to justice; social crises, e.g. due to encounters - or tensions - between social groups with differing cultural backgrounds or difficulties of a society when dealing with the rights of minorities.

The economic and financial crisis has proved a difficult test in terms of the pursuit of European integration and its legitimacy in the eyes of citizens, who are forced to accept cuts in wages and welfare provision. In addition, falling political participation and the rise of populist groups and rhetoric in various European countries even before such a crisis, suggest that the crisis of European democracies is possibly more 'endemic'. The ability of citizens to develop resilience in the event of crises – rather than opting for fatalism or rejecting any involvement in public life - is thus a fundamental issue for the EU, its Member States and beyond.

Research dimensions

Research should examine the following issues from a multidisciplinary perspective:

- What rights, including those rights stemming from EU citizenship – such as the right to free movement – are most at risk in the case of economic, political or social crises, which ones are less affected, and what are the mechanisms underlying the depletion of rights;
- How citizens claim and enact their rights in crisis situations, for instance when seeking access to justice at various levels (from local to European and international), or taking part in the democratic life of their country/region, as opposed to disillusionment with the political process or violent forms of protest;
- How citizens adapt and learn from transformations and how social, economic or cultural crises can shape relations between citizens and institutions/administrations at a variety of levels, possibly contributing to the emergence of innovative solutions and opportunities to deal with change, or - on the contrary – leading to conservative or protectionist behaviours;
- Which alternative forms of resilience do they develop at difficult times, including strengthening of social and family networks and community practices to foster solidarity when confronted by crises, changing lifestyles towards more sustainable forms of consumption and production, developing new artistic expressions as a form of resilience, moving abroad for short or long periods, or, on the contrary, reducing their mobility, etc. and how do these behaviours affect their relations with other groups, including from a multicultural perspective. Research would benefit from an analysis of the role of women in crisis situations, and of their impact on family and community practices.

A comparative and historical dimension would bring a strong added-value to the analysis. Focusing on the situation of the most vulnerable groups, including children, is encouraged.

Funding scheme: Collaborative project (small or medium-scale focused research project)

Topic for a small or medium-scale focused research project:

SSH.2013.5.1-2. Addressing demand in anti-trafficking efforts and policies

Context

Trafficking in human beings is a grave violation of human rights. It is a highly profitable – often organised – crime that knows no barriers in terms of age, gender or geographical location. Although victims of trafficking in human beings tend to come from third countries, reports of instances of internal trafficking – i.e. trafficking within the EU or individual Member States and other European countries – are on the increase. Human beings are trafficked into different forms of exploitation, such as sexual exploitation, forced labour and services, forced begging, exploitation in criminal activities and the removal of organs. Trafficking in human beings – as a complex and constantly evolving phenomenon – needs to be addressed in an integrated manner, involving a wide range of disciplines and focusing on prevention, protection and prosecution in equal measure. To make prevention more effective, recent EU legislation introduces a legal obligation to take measures to discourage and reduce demand, because demand for cheap goods and services seems to foster an environment where people are exploited for profit. It is therefore timely to conduct research into the demand side of trafficking in order to identify and understand the evidence on which more effective policy and law can be based.

Research dimensions

Interdisciplinary and comparative research should investigate the different approaches towards addressing and reducing demand in anti-trafficking efforts in Europe, in order to better understand how the effectiveness of current EU and national policies and legislation can be enhanced. Taking stock of research conducted so far, the analysis should take into account the complex nature and conceptual dimensions of demand, which includes demand by employers, consumers and those facilitating the trafficking process. The role of the socio-economic, cultural and legal context in the different Member States and other concerned European countries in shaping demand and its course over time, including from a gender perspective, need to be addressed. A wide range of perspectives, including those of public authorities, civil society organisations and the media should be taken into account. In particular, research should elaborate further on the following aspects:

- The impact of migration policies, regulation of the labour market, legislation on prostitution and social inclusion opportunities, on the demand for the services provided by victims of trafficking in human beings, and their interactions with forms of multiple discrimination, including on grounds of gender and ethnicity;
- The way in which states address demand through legislation, especially by criminalising demand or certain types of demand, including an analysis of the results to date;
- The role of Information Communication Technologies (ICT), in particular the internet, in fostering and reducing demand;
- The effects of different awareness raising campaigns on demand at both national and European level;

- The specific effects of large events, such as sporting events, should be considered.
- The impact of shifts in the economic and financial landscape on demand, such as the current economic crisis, could also be assessed.

Funding scheme: Collaborative project (small or medium-scale focused research project)

Area 8.5.2. Diversities and commonalities in Europe

Objective

The objective is to develop a better understanding of how to build a multilingual European society that preserves linguistic diversity, with a view to reinforcing policies aimed at strengthening language skills in Europe and improving employability and social cohesion. Research also aims to learn more about how Europe's cultural heritage is perceived, used and transmitted with a view to assessing its potential to stimulate new forms of innovation, job creation and growth.

Expected impact

Research will advance the knowledge base in the areas of language teaching, developing multilingual competences and the role of language in effective communication and citizenship, as well as the economic and societal potential of cultural heritage and its contribution to EU identities. Projects will achieve a critical mass of resources in terms of collaboration, networking and mobility of researchers, and will involve the relevant communities, stakeholders and practitioners in research and innovation.

Topic for a large-scale integrating project:

SSH.2013.5.2-1. The multilingual challenge for the European citizen

Context

As a result of the most recent enlargement in 2007, the current European Union now comprises 27 countries and acknowledges 23 official languages in which EU law has equal effect. A multitude of regional and minority languages can be added to this list, such as sign languages, as well as all of the languages spoken by the various immigrant communities living in Europe.

Aside from successive enlargements, the linguistic landscape of the EU has been influenced by globalisation, regionalisation, increased intra-European mobility and trade and technological advances, as well as increased contacts between members of different language communities in the EU and also between the EU and other parts of the world. The increased diversity of languages within the EU has been accompanied by the growing prevalence of English, which has become – for better or for worse – the predominant language in globalised business, science and entertainment.

In the context of an ever closer Union and a globalised economy, the European Union needs to preserve its linguistic diversity and take full advantage of the potentials of multilingualism in order to create and maintain work for its citizens, facilitate cross-border activities, deliver

social and territorial cohesion, foster intercultural dialogue and understanding, and ensure that all of its citizens play an active part in the construction of a common Europe.

There is a considerable gap between citizens who are proficient in two or more languages and who can thus benefit from all professional and personal opportunities that the EU can offer, and those who - because they only speak their mother tongue - find their opportunities limited. This divide has repercussions on the employability and on the risk of poverty and social exclusion of a part of the population; it might create new social divides and weaken the competitiveness of Europe as a whole. It also impedes the further development of a common European identity, limits deeper European integration and prevents citizens from having access to the information they need in order to participate in the democratic life of the EU and the Member States.

Immigration to Europe has considerably increased linguistic diversity too. It can be seen as an opportunity for the EU's economic performance and its positioning in the world (e.g. interactions with neighbourhood countries or other strategically important regions). At the same time, the problems with integrating some of the migrants include their inability to use the language of the region or country where they reside and thus complicate their full inclusion in a European society.

The costs of failing to achieve a multilingual European society that preserves its linguistic diversity would be not only economic, but also political, social, cultural and cognitive.

Research dimensions

Interdisciplinary research – drawing on a range of disciplines in the field of humanities and social sciences, such as linguistics, political sciences, sociology, law, history, psychology, economics, educational sciences, philosophy and anthropology – will take the following dimensions into consideration in order to close the gap between multi- and monolingual citizens and to improve employability and cohesion:

- Comparative analyses of past and present language-related policies and actions of the EU, individual European countries, the Council of Europe and other parts of the world (e.g. USA, Canada, India, China, Australia): What is the comparative advantage of the measures adopted by these countries and actors in bringing about a more cohesive society through individual/societal multilingualism and effective communication?;
- Research into past and present coping strategies (e.g. political, social, cultural, educational) of linguistic diversity in situations of language hegemony; research into language as an instrument of political power, which might lead to the disappearance of regional or minority languages and cultures or, on the contrary, to their proliferation;
- Research on how to strike a balance between preserving linguistic diversity (and the associated identity) and facilitating effective communication between all European citizens; incorporating the micro-level (monolingual/multilingual citizens), the meso-level (multilingual cities, regions and countries) and the macro-level (multilingual Europe);
- Assessment of the advantages and disadvantages of language teaching at various levels (pre-school, primary, secondary, adult - life-long learning) and of various forms of language learning (family teaching, informal learning in peer groups);
- Research on multilingual education and learning, as well as emerging needs related to enlargement, migration and globalisation;
- Assessment of new technological tools, new forms of communication, new media and their effect on multilingual skills, as well as suggestions about how to improve systems and mechanisms designed to recognise and certify language proficiency acquired through formal, informal and non-formal learning;

- Research on the role of translation and interpreting with regard to issues that require a specific public policy, such as the socialisation of migrants (e.g. access to health and social security or the right to interpretation and translation in court proceedings);
- Foresight on the future of a multilingual Europe in a globalised world, including the contribution of the language industry (translation, interpretation, language technologies, localisation, training of language professionals).

Funding scheme: Collaborative project (large-scale integrating research project)

Topic for a small or medium-scale focused research project:

SSH.2013.5.2-2. Transmitting and benefiting from cultural heritage in Europe

Context

Cultural heritage, both tangible and intangible, includes a wide range of artistic and cultural forms of expression, including literature, the visual arts, architecture, music and theatre, and can provide important benefits for society and the economy. European citizenship as well as economic and social development demand a better protection, promotion and use of the European cultural heritage, especially as it has a significant, although often untapped, potential for stimulating jobs and economic growth, improving social and territorial cohesion and defining new types of artistic careers. That is why it is important to foster creative and innovative approaches, including the development of new tools and methods, in order to preserve the cultural heritage and pass it on to future generations of Europeans.

Research dimensions

The research should address the following subjects:

- Behavioural and identity aspects: the ways in which young generations of Europeans appropriate, enrich, promote and transmit cultural heritage and values in multicultural societies, including through the use of new technologies. In this context, the role of cultural actors, infrastructures such as cultural foundations or museums and their networking should be investigated, as well as the interface between cultural heritage, behaviours and identity in order to forge a sense of EU-belonging.
- Social and territorial cohesion: how the emergence of new uses and the re-use of historical buildings and sites can result in sustainable models for cultural heritage preservation, restoration and management; how cultural heritage can contribute to developing the attractiveness and quality of life of territories, addressing more intangible issues (i.e. going beyond the GDP perspective); the added value created by cultural tourism and specific regional aspects, such as landscape and gastronomy and the contribution to the economic and social development of European regions and cities, including job creation.
- Economics and measurement: quantitative data relating to the impact and the value of cultural heritage, the potential for creating jobs, for economic growth, and for exporting EU best practices to third countries; how cultural heritage relates to the development of new cultural industries, as well as the major spin-offs that this sector produces in other sectors of local economies.
- Traditional skills and know-how: how to protect and promote traditional skills and professions in the area of cultural heritage. In this regard, Europe has developed expertise which combines traditional skills and cutting edge innovation, and which has

gained international recognition. How can this competitive advantage be further developed and valorised internationally?

- New artistic careers: their legal status, new roles and the specific conditions related to creativity and flexibility (e.g. fashion, design, crafts, electronic editing) should be explored.

This topic supports and complements the Joint Programming Initiative (JPI) on Cultural Heritage and Global Change.

Funding scheme: Collaborative project (small or medium-scale focused research project)

Activity 8.6 Socio-economic and scientific indicators

Rationale

Effective policy making, as well as robust socio-economic research, require, reliable longitudinal data of high quality, which are comparable across countries. In Europe, there are a number of databases and surveys that provide data about children and young people; however, none of them is comprehensive enough and they are not comparable with each other.

Area 8.6.1. How indicators are used in policy (no topic in 2013)

Area 8.6.2. Developing better indicators for policy (no topic in 2013)

Area 8.6.3 Provision of underlying official statistics

Objective

The objective is to map the available data sources on children and youth, investigate their comprehensiveness and comparability, and identify gaps with a view to designing a complementary survey that would ensure harmonisation across countries.

Expected impact

The project will advance the knowledge base on the existing databases and surveys that provide data relating to children and young people. The project will achieve a critical mass of resources in terms of collaboration, networking and mobility of researchers and will involve the relevant communities, stakeholders and practitioners in the research, with the aim of designing and carrying out a complementary survey aimed at improving data availability and comparability.

Topic for a coordination and support action (supporting):

SSH.2013.6.3-1. Towards a European longitudinal childhood and youth survey

Although it is important that healthy emotional, physical and psychological life-styles should start from an early age, very little European comparative social and educational research is being done in order to ascertain what are the best policies and approaches to effectively promote the wellbeing of children and young people. Research into the perspective of children and young people with regard to the various aspects of care, education, leisure and wellbeing seems to be even more overdue - although it involves very significant methodological challenges. Moreover, in order to understand the development of demographic trends in Europe, an investigation of the lower end of the demographic pyramid is required.

To do this, we need a robust, representative and comparable dataset on the well-being of children/young people, child/youth related policies, childhood care and access to education, as well as on the environment in which a child grows up, which is primarily the family. Relational, organisational, participation, civic and leisure activities could also be included. To

ensure comprehensive coverage of this topic, it might be necessary to conduct a longitudinal survey, which would capture the full picture of the growing-up process from birth to the end of a child's education – possibly including aspects related to the transition to work and parenthood.

A multidisciplinary approach is needed in order to grasp the dynamic character of this process. The project should start with a mapping of data and cohort studies on children and young people that are available at national and/or European levels, and identifying gaps in scope and coverage, including levels of disaggregation of the existing official sources. Proposers should investigate the methodological challenges related to potential surveys which would address the gaps identified. The conduct of the survey should ensure an ex-ante harmonisation across countries. Ideally, such a survey should be implemented at least in a large, representative sample of the EU countries, in cooperation with Member States. As a first experimental step, a small-scale pilot survey could possibly be designed and implemented as part of this project.

Funding scheme: Coordination and support action (supporting)

Area 8.6.4 Use of indicators and related approaches for the evaluation of research policies and programmes (no topic in 2013)

Activity 8.7: Foresight activities

Rationale

Cities are at the centre of most economic and social activities in Europe. They also need to be at the heart of a successful transition to a post-carbon society, and this presents significant challenges for urban development. Innovative systems of urban planning and governance can be a major vehicle for stepping up sustainable development as part of changing demographics and lifestyles.

Area 8.7.1 Wide socio-economic foresight on key challenges

Objective

The objective is to assess the long term trends that impact on urban development and to explore innovative ways of achieving post-carbon, sustainable cities in the EU, thereby contributing to the Europe 2020 strategy goal of sustainable growth and to the Innovation Union flagship.

Expected impact

Projects will advance the knowledge base on the functioning and development of European cities and will define a road map of urban transition to a post-carbon economy. They will achieve a critical mass of resources in terms of collaboration, networking and mobility of researchers and will involve relevant communities, stakeholders and practitioners in the research and innovation fields, with a view to improving the management of natural resources and long-term sustainable development.

Topic for a small or medium-scale focused research project:

SSH.2013.7.1-1. Post-carbon cities in Europe: A long-term outlook

Context

Major new societal issues will come to light in cities in Europe, linked to demographic changes such as ageing and migration, moving from rural to urban and peri-urban areas, poverty and exclusion issues, health and environment. In this context, urban planning and urban governance play a major role. The development of innovative systems (e.g. habitat, transport, energy, water distribution) will have to be consistent with sustainable development. Taking stock of European and international activities in this field up to 2050 and beyond (cf. EU roadmaps in the field of energy, transport and greenhouse gas emissions as well as the reports from UN-Habitat), this forward-looking activity should address the specific issues of cities and towns and their role in economic growth, in shaping policy, pooling knowledge, attractiveness to people and enterprises, social cohesion and cultural interactions. Other issues may include urban environment and metabolism, ecosystem services and adaptation to climate change.

Long-term demographic, economic, social, political and technological trends will need to be assessed. Particular attention should be given to evaluating the economic and social impact of post carbon cities. Future megacities, as well as metropolitan areas and urban agglomerations greater than 1 million in Europe, will have to be considered - as well as small and medium

sized cities, which offer a particular potential for sustainable development given their compactness and attractiveness to different age groups.

Qualitative scenarios on urban development and quantification of urban trends and tensions should form part of the research work. Drawing up scenarios should be the subject of participative approaches involving researchers and stakeholders (representing civil society and policy makers in particular, but also planners and architects). These scenarios should be quantified by means of modelling and making the best possible use of raw data.

Research dimensions

Research should:

- Prepare qualitative scenarios on the future of EU cities (up to 2050 and beyond) and quantify the emerging trends and tensions in EU cities (demography, human behaviour, economic development, social cohesion);
- Explore and demonstrate innovative ways of achieving EU post-carbon cities, including a better management of urban economic, social and ecological flows dealing, for example, with water, waste and energy, as well as adapting to climate change;
- Identify the potential role for exporting EU urban best-practices to emerging and developing countries (cf. role of cities as "political powers"), and demonstrate the implementation of such practices by specific actions;
- Define an evidence-based 2050 Roadmap for EU post-carbon cities in a world context.

Funding scheme: Collaborative project (small or medium-scale focused research project)

Area 8.7.2. Focused thematic foresight (no topic in 2013)

Area 8.7.3. The Future Dynamics of Key S&T Actors in Europe (no topic in 2013)

Area 8.7.4. Blue Sky Research on Emerging Issues Affecting European S&T (no topic in 2013)

Area 8.7.5. Mutual Learning and Cooperation (no topic in 2013)

Activity 8.8.: Horizontal actions

Rationale

This Activity provides an opportunity to address a number of important research topics or strategic actions to develop the European Research Area in Social Sciences and the Humanities that cannot be addressed by the other main Activities.

Objective

The principal objective is to improve analysis and evaluation of outcomes of EU-funded research in socio-economic sciences and humanities in the context of their contribution to building the European Research Area.

Expected impact

The project will monitor the outcomes of EU-funded projects in socio-economic sciences and humanities and assess their impact. The project will achieve a critical mass of resources in terms of collaboration, networking and mobility of researchers, and will involve the relevant communities, stakeholders and practitioners.

Topic for a small or medium-scale focused research project:

SSH.2011.8-1. Evaluation, monitoring and comparison of the impacts of EU funded SSH research in Europe

Context

In order to draw lessons from the experience of FP 7 and steer Horizon 2020 according to objectives and constraints, a more permanent system of monitoring, evaluation and comparison of public funded socio-economic and humanities (SSH) research is needed.

A specific evaluation of the specific outcomes and impacts of Theme 8 "Socio-Economic Sciences and the Humanities" of the specific programme "Cooperation" of FP7 is needed to provide insights for the ex-post evaluation of the rationale, implementation and achievements of the Seventh Framework Programme (FP7) of the European Community for research, technological development and demonstration activities (2007 to 2013) planned for 2015. The first evaluation analyses of the impacts of SSH research should be available before the end of 2014.

In the longer-term, in order to define and steer better EU funded SSH research in Europe in line with the objectives of scientific excellence, policy relevance (the European research Area, the European agendas for growth, sustainable development and social inclusion and other important EU policies for citizenship and external affairs) and public relevance at large, it is expected that a more permanent system for the evaluation of EU funded SSH research can be developed which will feed into strategy and work programme development under Horizon 2020. It should take into account the newest evaluation tools in the fields of sciences and policies and also help develop specific tools for the evaluation of SSH excellence in Europe.

Research dimensions

The evaluation and monitoring work should concentrate on EU funded SSH research and include:

- its scientific outcomes and impacts, in particular in terms of quality of publications, training of young researchers, forms of interdisciplinarity and the constitution of networks of European scientific excellence;

- its impacts on the development of a European Research Area in SSH, in particular in terms of the role of the ERA-Nets and of art. 185 initiatives in the domain of SSH, the mobility of researchers and the circulation of concepts across national and disciplinary borders;
- its impacts on key EU policies, in fields such as growth, employment, education, social inclusion, innovation, coordination of national policies, sustainable development, citizenship, development policies and other EU external policies.
- its impacts on society, in particular the development of communication and other relevant competences among researchers in their interactions with civil society at large and their participation in national or European public spheres.

Sufficient comparison with national SSH research programmes should be part of the evaluation, in particular to allow the analysis of the so called "European added-value" of the EU funded research in SSH.

Funding scheme: Collaborative project (small or medium-scale focused research project)

III IMPLEMENTATION OF CALLS

Call title: FP7-SSH-2013 — Collaborative projects (large scale integrated research projects)

Call identifier: FP7-SSH-2013-1

- Date of publication 10 July 2012¹⁸;
- Deadline¹⁹: 31 January 2013 at 17.00.00 Brussels local time
- Indicative budget:²⁰ EUR 30 000 000

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call.

Topic called:

Activity/Area	Topic	Funding scheme and additional eligibility criteria
ACTIVITY 8.1: GROWTH, EMPLOYMENT AND COMPETITIVENESS IN A KNOWLEDGE SOCIETY		
Area 8.1.2 Structural changes in the European knowledge economy and society	SSH.2013.1.2-1 Overcoming youth unemployment in Europe	Collaborative project (large scale integrated project) <i>The requested European Union contribution shall not be less than EUR 4 000 000 and shall not exceed EUR 5 000 000</i>
ACTIVITY 8.2: COMBINING ECONOMIC, SOCIAL AND ENVIRONMENTAL OBJECTIVES IN A EUROPEAN PERSPECTIVE		
Area 8.2.1 Socio-economic development trajectories	SSH.2013.2.1-1 Obstacles and prospects for sustainable lifestyles and green economy in Europe	Collaborative project (large scale integrated project) <i>The requested European Union contribution shall not be less than EUR 4 000 000 and shall not exceed EUR 5 000 000</i>

¹⁸ The Director General responsible for the call may publish it up to one month prior or after the envisaged date of publication.

¹⁹ The Director General responsible may delay this deadline by up to two months.

²⁰ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

ACTIVITY 8.3: MAJOR TRENDS IN SOCIETY AND THEIR IMPLICATIONS		
Area 8.3.2 Social trends and lifestyles	SSH.2013.3.2-1 Social Innovation – empowering people, changing societies?	Collaborative project (large scale integrated project) <i>The requested European Union contribution shall not be less than EUR 4 000 000 and shall not exceed EUR 5 000 000</i>
ACTIVITY 8.5: THE CITIZEN IN THE EUROPEAN UNION		
Area 8.5.2 Diversities and commonalities in Europe	SSH.2013.5.2-1 The multilingual challenge for the European citizen	Collaborative project (large scale integrated project) <i>The requested European Union contribution shall not be less than EUR 4 000 000 and shall not exceed EUR 5 000 000</i>

- **Eligibility conditions:**

- The general eligibility criteria are set out in Annex 2 to this work programme, and in the Guide for Applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

Funding scheme	Minimum conditions
Collaborative Project (large scale integrating project)	At least 5 independent legal entities, each of which is established in a MS or AC ²¹ , and no 2 of which are established in the same MS or AC.

- The minimum requested EU contribution under the funding scheme 'Collaborative project (large scale integrated project)' is EUR 4 000 000
- The maximum requested EU contribution under the funding scheme 'Collaborative project (large scale integrated project)' is EUR 5 000 000

- **Evaluation procedure:**

- At least the top-ranked proposal per Activity will be selected for funding provided it passes all required evaluation thresholds;
- A maximum of two proposals per Activity will be selected for funding;

²¹ MS = Member State, AC = Associated Country (for list of countries associated to the Framework Programme please see http://ec.europa.eu/research/participants/portal/page/fp7_documents)

- The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme;
- The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme;
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission;
- The Commission will instruct expert evaluators to disregard any pages exceeding these limits;
- The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers);
- A one-stage submission procedure will be followed;
- Experts will carry out the individual evaluation of proposals remotely, with the consensus session being held in Brussels;
- The evaluation criteria and sub-criteria, together with the eligibility, selection and award criteria for the different funding schemes are set out in Annex 2 to the work programme. For this call, the scientific and/or technological excellence evaluation criterion will include the following additional sub-criterion: ‘appropriate comparative perspective and the largest possible European (international, where applicable) coverage in relation to the subject of research (though not necessarily simply by reason of a geographically diverse consortium)’;

Proposals will be ranked at the call level according to the procedure described in Annex 2 in strict order of marks, taking into account the fact that at least one proposal per topic will be selected provided it passes all evaluation thresholds.

First, the top-ranked proposals within each Activity will be selected for funding. Subsequently, the remaining top proposals ranked at the call level will be selected within the available funds for this call. The remaining proposals passing all the thresholds will form a reserve list in strict order of marks.

Any parts of the budget of this call that will remain unspent will be transferred to the call FP7-SSH-2013-2.

- **Indicative evaluation and contractual timetable:** evaluation of proposals will take place in May 2013 and first grant agreements are expected to be signed in November 2013.
- Participants are required to conclude a consortium agreement prior to grant agreement.
- **The forms of grant** which will be offered and the maximum reimbursement rates are specified in Annex 3 to the work programme.
- **Flat rates to cover subsistence costs:** In accordance with Annex 3 to the work programme, this call offers the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: https://ec.europa.eu/research/participants/portal/page/fp7_documents under ‘Guidance documents for FP7/Financial issues/Flat rates for daily allowances’.

Dissemination: Grant agreements for projects financed under this call for proposals will include the special clause 39 on ‘Open Access in FP7’. Under this clause, beneficiaries are required to make their best efforts to ensure free access to peer-reviewed articles resulting from projects via an institutional or subject-based repository.²²

²² Please see:

http://ec.europa.eu/research/participants/portal/ShowDoc/Extensions+Repository/General+Documentation/Legal+documents+for+implementation/Model+grant+agreement/General/fp7-ga-clauses_en.pdf

Call title: FP7-SSH-2013 — Collaborative projects (small or medium-scale focused research projects) as well as coordination and support actions

Call identifier: FP7-SSH-2013-2

- Date of publication 10 July 2012²³;
- Deadline²⁴: 31 January 2013 at 17.00.00 Brussels local time
- Indicative budget:²⁵ EUR 68 000 000; *Indicative budget breakdown of this call per Activity is shown in the table below*

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

• **Topics called:**

Area	Topic	Funding scheme and additional eligibility criteria
<p>ACTIVITY 8.1: GROWTH, EMPLOYMENT AND COMPETITIVENESS IN A KNOWLEDGE SOCIETY</p> <p>(TOTAL BUDGET PER ACTIVITY EUR 14,5 MILLION)</p>		
Area 8.1.1 Changing role of knowledge throughout the economy	SSH.2013.1.1-1 Economic underpinnings of social innovations	Collaborative project (small or medium-scale focused research project) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
	SSH.2013.1.1-2 Intangibles in the public sector - an unrecognised source for innovation, well-being and smart growth	Collaborative project (small or medium-scale focused research project) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
Area 8.1.3 Strengthening policy coherence and	SSH.2013.1.3-1 The impact of	Collaborative project (small or medium-scale focused

²³ The Director General responsible for the call may publish it up to one month prior or after the envisaged date of publication.

²⁴ The Director General responsible may delay this deadline by up to two months.

²⁵ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

coordination in Europe	ageing societies on public finances in Europe	research project) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
	SSH.2013.1.3-2 Better integrating financial markets into, policy focussed, macro models	Collaborative project (small or medium-scale focused research project) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
<p>ACTIVITY 8.2: COMBINING ECONOMIC, SOCIAL AND ENVIRONMENTAL OBJECTIVES IN A EUROPEAN PERSPECTIVE</p> <p>(TOTAL BUDGET PER ACTIVITY EUR 7,5 MILLION)</p>		
Area 8.2.1 Socio-economic development trajectories	SSH.2013.2.1-2 Social entrepreneurship for innovative and inclusive societies	Collaborative project (small or medium-scale focused research project) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
	SSH.2013.2.1-3 The role of multinational companies in addressing global development challenges	Collaborative project (small or medium-scale focused research project) for specific cooperation action dedicated to international cooperation <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
<p>ACTIVITY 8.3: MAJOR TRENDS IN SOCIETY AND THEIR IMPLICATIONS</p> <p>(TOTAL BUDGET PER ACTIVITY EUR 11 MILLION)</p>		
Area 8.3.1 Demographic changes	SSH.2013.3.1-1 Addressing European governance of temporary migration and mobility to Europe	Collaborative project (small or medium-scale focused research project) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
Area 8.3.2 Societal trends and lifestyles	SSH.2013.3.2-2 Early childhood education and care: promoting quality for individual, social and economic benefits	Collaborative project (small or medium-scale focused research project) <i>The requested European Union contribution shall not exceed EUR</i>

		2 500 000
	SSH.2013.3.2-3 The impact of the third sector on socio-economic development in Europe	Collaborative project (small or medium-scale focused research project) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
ACTIVITY 8.4: EUROPE IN THE WORLD		
(TOTAL BUDGET PER ACTIVITY EUR 17,5 MILLION)		
Area 8.4.1 Interactions and interdependences between world regions and their implications	SSH.2013.4.1-1 Security and democracy in the neighbourhood: the case of the Caucasus	Collaborative project (small or medium-scale focused research project) for specific cooperation action dedicated to international cooperation <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
	SSH.2013.4.1-2 Facing transition in the South and East Mediterranean area: empowering the young generation	Collaborative project (small or medium-scale focused research project) for specific cooperation action dedicated to international cooperation <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
Area 8.4.2 Conflicts, peace and human rights	SSH.2013.4.2-1 Media in conflicts and peace building	Collaborative project (small or medium-scale focused research project) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
Area 8.4.3 Europe's changing role in the world	SSH.2013.4.3-1 EU-India Social Sciences and Humanities Platform	Coordination and support action (supporting) <i>The requested European Union contribution shall not exceed EUR 1 500 000</i>

	SSH.2013.4.3-2 Transatlantic Social Sciences and Humanities Platform	Coordination and support action (supporting) <i>The requested European Union contribution shall not exceed EUR 1 500 000</i>
	SSH.2013.4.3-3 Untapped potential for growth and employment – reducing the cost of non-tariff measures in goods, services and investment	Collaborative project (small or medium-scale focused research project) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
ACTIVITY 8.5: THE CITIZEN IN THE EUROPEAN UNION		
(TOTAL BUDGET PER ACTIVITY EUR 11 MILLION)		
Area 8.5.1 Participation and citizenship in Europe	SSH.2013.5.1-1 Citizens' resilience in times of crisis	Collaborative project (small or medium-scale focused research projects) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
	SSH.2013.5.1-2 Addressing demand in anti-trafficking efforts and policies	Collaborative project (small or medium-scale focused research projects) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
Area 8.5.2 Diversities and commonalities in Europe	SSH.2013.5.2-2 Transmitting and benefiting from cultural heritage in Europe	Collaborative project (small or medium-scale focused research projects) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
ACTIVITY 8.6: SOCIO-ECONOMIC AND SCIENTIFIC INDICATORS		
(TOTAL BUDGET PER ACTIVITY EUR 1,5 MILLION)		
Area 8.6.3 Provision of underlying official statistics	SSH.2013.6.3-1 Towards a European longitudinal childhood and youth survey	Coordination and Support action (supporting action) <i>The requested European Union contribution shall not exceed EUR 1 500 000</i>

ACTIVITY 8.7 FORESIGHT ACTIVITIES		
(TOTAL BUDGET PER ACTIVITY EUR 2,5 MILLION)		
Area 8.7.1 Wide socio-economic foresight on key challenges	SSH.2013.7.1-1 Post carbon cities in Europe: A long-term outlook	Collaborative project (small or medium-scale focused research projects) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>
ACTIVITY 8.8.: HORIZONTAL ACTIONS		
(TOTAL BUDGET PER ACTIVITY EUR 2,5 MILLION)		
	SSH.2013.8.1 Evaluation, monitoring and comparison of the impacts of EU funded SSH research in Europe	Collaborative project (small or medium-scale focused research projects) <i>The requested European Union contribution shall not exceed EUR 2 500 000</i>

- **Eligibility conditions:**

- The general eligibility criteria are set out in Annex 2 of this work programme, and in the Guide for Applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- The maximum requested EU contribution under the funding schemes is indicated for each topic in the table above.
- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

Funding scheme	Minimum conditions
Collaborative Project (small or medium-scale focused research project)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC.
Collaborative Project (small or medium-scale focused research project) for specific cooperation action dedicated to international cooperation	At least 4 independent legal entities, 2 of which are established in a MS or AC, and none of which are established in the same MS or AC. The other 2 must be established in different international cooperation partner countries (ICPC) ²⁶ .

²⁶ Please see Annex 1 of the ‘Cooperation’ work programme for the list of International Cooperation Partner Countries (ICPC).

	<p>Additional eligibility criteria:</p> <p>1) SSH.2013.2.1-3 The role of multinational companies in addressing global development challenges: <u>minimum conditions for ICPC partners apply to Africa, Asia, Latin America and the Caribbean.</u></p> <p>2) SSH.2013.4.1-1. Security and democracy in the neighbourhood: the case of the Caucasus: <u>at least 2 ICPC partners from different countries of the Caucasus region.</u></p> <p>3) SSH.2013.4.1-2. Facing transition in the South and East Mediterranean Area: empowering the young generation: <u>at least 4 ICPC partners from different countries of the South and East Mediterranean area.</u></p>
<p>Coordination and support action (supporting action)</p>	<p>At least 1 independent legal entity.</p>

Evaluation procedure:

- For collaborative projects: at least one proposal per topic will be selected for funding provided it passes all evaluation thresholds;
- A maximum of two collaborative projects per topic will be selected for funding with the exception of topics SSH.2013.7.1-1 and SSH.2013.8.1 where only one collaborative project will be selected provided it passes all evaluation thresholds;
- For Coordination and Support Actions: only the top-ranked proposal per Coordination and Support Action will be selected for funding provided it passes all required evaluation thresholds;
- The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme;
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission;
- The Commission will instruct the expert evaluators to disregard any pages exceeding these limits;
- The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers);
- A one-stage submission procedure will be followed;
- Experts will carry out the individual evaluation of proposals remotely, with the consensus session being held in Brussels;
- The evaluation criteria and sub-criteria, together with the eligibility, selection and award criteria for the different funding schemes are set out in Annex 2 to the work programme. For this call the scientific and/or technological excellence evaluation criterion will include the following additional sub-criterion: ‘appropriate comparative perspective and the largest possible European coverage in relation to the subject of

research (though not necessarily simply by reason of a geographically diverse consortium)'.

Proposals will be ranked within each Activity according to the procedure described in Annex 2, taking into account the fact that at least one proposal per topic will be selected provided it passes all evaluation thresholds.

First, highest ranked proposals within each Activity will be selected for funding up to the budget limit envisaged for each Activity.

In each Activity, the rest of proposals ranked above the evaluation threshold will be put in a reserve list. Within each reserve list, proposals will also be ranked in strict order of marks.

Subsequently, any additional funds that may become available will be allocated to proposals across the different reserve lists, respecting only the strict order of marks (with no hierarchical order between Activities).

Procedure for prioritising proposals with equal scores

Between proposals of equal marks, priority will be given to proposals that address topics that are not otherwise covered by more highly-rated proposals. In cases where all topics concerned are already covered, priority will be given to proposals with the highest marks in the criterion of scientific quality. In cases of equal marks in the criterion of scientific quality, priority will be given to proposals with higher marks in the criterion of potential impact.

- **Indicative evaluation and contractual timetable:** evaluation of proposals will take place in May 2013 and first grant agreements are expected to be signed in November 2013.
- Participants are required to conclude a consortium agreement prior to grant agreement.
- **The forms of grant** which will be offered and the maximum reimbursement rates are specified in Annex 3 to the work programme.
- **Flat rates to cover subsistence costs:** In accordance with Annex 3 to this work programme, this call offers the possibility of using flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: https://ec.europa.eu/research/participants/portal/page/fp7_documents under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

Dissemination: Grant agreements for projects financed under this call for proposals will include the special clause 39 on 'Open Access in FP7'. Under this clause, beneficiaries are required to make their best efforts to ensure free access to peer-reviewed articles resulting from projects via an institutional or subject-based repository.²⁷

²⁷ Please see:

http://ec.europa.eu/research/participants/portal/ShowDoc/Extensions+Repository/General+Documentation/Legal+documents+for+implementation/Model+grant+agreement/General/fp7-ga-clauses_en.pdf

IV OTHER ACTIONS²⁸

Rationale

This chapter includes any other relevant actions in the area of Socio-economic Sciences and Humanities that aim at supporting the European Commission, the Member States and the research community in policy making in this area.

Expected impact

The proposed action should improve knowledge base on integrating better social sciences and humanities across EU research policy to use its full potential in addressing societal challenges.

SSH.2013.8-2 Lithuanian Presidency conference on the input of SSH to European and global development

A conference will be organised to discuss the role of social sciences and the humanities (SSH) in the light of the new Framework Programme for Research and Innovation "Horizon 2020" and the EU's growth strategy "Europe 2020", combining them with societal challenges. Horizon 2020 plans to include for each societal challenge a cross-cutting SSH dimension given that the societal challenges facing Europe are not only technological but also of profound social and cultural natures. The conference will focus on the methodological and knowledge foundations that define the abilities of SSH to contribute to addressing these societal challenges under Horizon 2020. It will help to analyse what changes in scientific design and practices are needed and what good paradigms and practices in research policy could inspire European policies and research practices across countries.

The programme of the conference will integrate lessons drawn from projects funded under FP7 and other national or international research programmes giving room to innovative interdisciplinarity and transdisciplinarity.

Funding scheme: Coordination and Support Action - Grant to an identified beneficiary

Recipient Legal entity: Mykolas Romeris University, Ateities str. 20, LT-08303 Vilnius, Lithuania

Rate of co-financing: up to 75% of conference costs

Budget (EU maximum requested contribution): EUR 150 000

Selection and award criteria: The selection and award criteria of Article 15 of the FP7 EC Rules of Participation will apply, as described in Annex 2 for Coordination and Support Actions.

²⁸ In accordance with Article 14, 17 and 27 of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

V BUDGET**Indicative budget for the Theme Socio-economic Sciences and Humanities for the 2013 Work Programme (in EUR million)²⁹**

Call FP7-SSH-2013-1	30,00
Call FP7-SSH-2013-2	68,00
Call FP7-ERANET-2013-RTD³⁰	6,00
General activities	0,95
Other activities	1,63
<ul style="list-style-type: none"> • Evaluations (1,181) • Monitoring and reviews (0,3) • Actions implemented through grants to identified beneficiaries (0,15) 	
Estimated total budget	106,58

Budget allocation to general activities 2013 (EUR)

CORDIS	148 622
Eureka/Research Organisations	7 525
COST	790 866
Experts (eval + rev) horizontal taxation	1 881
Total	948 894

All budgetary figures given in this work programme are indicative. The final budgets may vary following the evaluation of proposals.

The final budget awarded to actions implemented through calls for proposals may vary:

- The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

For actions not implemented through calls for proposals:

- The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions;
- The final budget awarded for all other actions not implemented through calls for proposals may vary by up to 10% of the indicated budget for these actions.

²⁹ Under the condition that the draft budget 2013 is adopted without modifications by the Budgetary Authority.

³⁰ See Annex IV.

WORK PROGRAMME 2013

COOPERATION

THEME 9

SPACE

(European Commission C(2012) 4536 of 09 July 2012)

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THEME 9: SPACE

Objective:

The objective of the FP7 space work programme is to support a European Space Policy focusing on applications such as GMES (*Global Monitoring for Environment and Security*), with benefits for citizens, but also other space foundation areas for the competitiveness of the European space industry and scientific community. This will contribute to fulfil the overall objectives of the European Space Policy, complementing efforts of Member States and of other key players, including the European Space Agency.

I. CONTEXT

Policy context

Europe has been active in the space sector for several decades, and activities encompass a wide spectrum ranging from launchers to applications and satellites. Space activities, through scientific research and especially through their direct applications, are acknowledged as strategic for their contribution to the construction of Europe and the competitiveness of the European Union.

The **Treaty on the Functioning of the European Union** (TFEU) has strengthened the European Union's competence in the area of space and confirms the strategic importance of space for the European Union. The Treaty gives the European Union the responsibility to draw up a European space policy and, to this end, to promote joint initiatives, **to support research and technological development**, and to coordinate space related efforts.

Besides its strategic relevance, the space sector provides a stimulus to innovation and growth in the European economy, and thus space research is expected to contribute significantly to the **Europe 2020 priorities**, especially with regard to **Smart and Sustainable Growth and Innovation**. Support to the space sector is crucial if the EU wants to remain competitive at global level.

Furthermore, Europe is increasingly dependent on space infrastructure and applications thereof for the daily functioning of our society and proper policy development and implementation at European and national level. Space research thus **supports EU policies** and contributes to **addressing major societal challenges**, e.g. in climate change, resource efficiency, transport, citizen's security, natural and man-made disasters, and health care. Space technologies are supported with a view to generate applications and services that benefit European citizens (e.g. environmental monitoring, security), and to stimulate technology spin-offs that benefit other industrial sectors. Given the size of investments needed to develop these sectors, there is a clear added value of common and coordinated EU-level action.

Addressing Innovation Union aspects

Against the backdrop of the current economic situation and increased global competition, the Union has defined a strategy to support growth and job creation, Europe 2020. The Innovation Union Flagship initiative supports this strategy through specific commitments. Research and innovation are key drivers of competitiveness, jobs, sustainable growth and social progress.

The work programme 2013 aligns with, and contributes towards, the objectives of Europe 2020, the Innovation Union Flagship, and other EU policies. There is a determined focus on fostering new ideas, supporting world class teams tackling significant societal challenges, and on ensuring that the fruits of our investments can be properly exploited.

In this way the work programme provides for a smooth transition towards the new research and innovation programme for 2014-2020, Horizon 2020.

The Innovation Union initiative underlines that research and innovation are key drivers of competitiveness, jobs, sustainable growth and social progress. The work programme 2013 will be designed keeping the implementation of the Innovation Union initiative in mind, and in particular to bring together research and innovation to address major challenges.

This work programme contains innovation measures in support of activities closer to market such as:

- By supporting more topics aimed at generating knowledge to deliver new and more innovative products, processes and services: This is particularly relevant for Activity 9.1 supporting **space based applications**. The focus on development of services, with a goal of reaching self-sustainability, is reflected in the objectives and scope of the specific topics open for participation. A specific focus on innovative products is placed in the context of **SME actions** under Activity 9.3.
- By identifying and addressing exploitation issues, like capabilities for information and dissemination, and by enhancing the use of the generated knowledge: This aspect is taken up specifically in Activity 9.2, Area 1, which addresses **exploitation of European space science and exploration data**.

Underpinning a European space policy

The Commission has adopted in 2011 a Communication on the EU space strategy¹ to state its priorities. These include: safeguarding European access to space, contributions of space to global/societal challenges (e.g. climate change, resource efficiency, energy, health), security in and from space, space exploration, space science, space as a driver for innovation and competitiveness, and the EU's participation in international space projects.

The work programme will contribute to these objectives in the following ways:

- European **access to space** has to be safeguarded through a non-dependence of Europe on critical space technologies. This recurring theme in FP7 annual calls will be supported again in 2013 in Activity 9.2, Area 2, research to support critical space technologies.

¹ COM(2011) 152 final, 4 April 2011, "Towards A Space Strategy for the European Union that Benefits its Citizens"

- Contributions of space to the **global/societal challenges** are addressed through Activity 9.1 of space based applications at the service of European Society.
- Research and development in Activity 9.2 “Strengthening Space Foundations” will address the priorities of **space exploration, space science, and foster space as a driver for innovation and competitiveness.**
- As regards the **security of space assets**, and their associated ground facilities, these are sensitive to external events that can endanger their proper functioning, such as space debris, jamming, viruses, natural or man-made electro-magnetic disturbances. Specific research to reduce the vulnerability of such space assets will be addressed.

Global Monitoring for Environment and Security (GMES)

The strategic role of GMES in the development of the EU’s role as a global actor has been outlined already in the February 2004 Communication² of the Commission, which also identifies the **major EU policies to be addressed by GMES services and the R&D projects** to be undertaken in FP7.

With the entering into force of the Regulation (EU) No 911/2010 of the European Parliament and Council³ on the European Earth monitoring programme (GMES) and its initial operations (2011-2013), the R&D build-up phase of GMES now will direct research funding to those service domains which have not yet reached the required maturity to be operational, to complete the transition phase to operations.

In order to optimise the available resources (both from the GMES Regulation and from the theme Space of the Specific Programme Cooperation), funding from the GMES Regulation budget will support initially:

- the land monitoring and emergency management themes of the service component of the GMES programme;
- the GMES space component;
- GMES policy measures set out by the Regulation.

In the 2011-2013 period the other four GMES services (marine, atmosphere, climate change and security) are mainly financed by FP7 funds. The total FP7 budget foreseen for the 3-years period for each of these 4 domains is in the order of EUR 20-30 million. Marine, atmosphere and security services have already been prioritised in the 2011 and 2012 work programmes. The 2013 work programme will now continue this build-up objective by prioritising developments which are prerequisites for a **climate change service.**

International Cooperation

In the context of international cooperation, a diversified approach is a key element in Europe’s space policy. Candidates for cooperation among other established or emerging space powers are the United States, Russia, Canada, People’s Republic of China, India, Japan, and the Ukraine. Following bilateral consultations with Ukraine during 2011, topics which are of mutual interest and benefit for European industry and the Ukraine will be highlighted in the call.

² COM(2004)65 final, 3 February 2004

³ OJ, L 276, 20.10.2010, p. 1.

In general, the participation of countries for which a specific Space dialogue (e.g. South Africa) or S&T cooperation agreements (e.g. Brazil) are in place, or third countries included under the ICPC⁴ list, is particularly welcome. The use of space applications can contribute to their economic and social development and support environmental protection.

Furthermore, for GMES to become the main European contribution to the global 10-year implementation plan for the Global Earth Observation System of Systems (GEOSS), FP7 GMES projects will also provide opportunities for data exchange with international partners, in the area of environment monitoring (especially in areas such as global climate change), and will encourage the increased use of Earth observation, as well as the development of a system of worldwide observation systems.

SME relevant research

All actions are open to the participation of all space stakeholders: industry, including Small and Medium Enterprises (SMEs), research organisations, universities, as well as public authorities, non-governmental organisations and public and private organisations in the space domain. Considering the objective of increasing the competitiveness of industry, the broad **involvement of SMEs** in consortia is highly encouraged.

As in 2012, and in order to further promote the participation of SMEs in the Space theme, the topic "SME space technology research and technology transfer" (Activity 9.3 – Cross cutting activity) will be reserved for proposals where more than 50% of the requested EU contribution goes to SMEs and where SMEs are present preferably in a leading or coordinating role. This will be implemented as strict eligibility criteria.

Bridging with Horizon 2020

Horizon 2020 emphasises the need to enable European competitiveness, non-dependence and innovation in space. Contributing to Europe's non-dependence from imports of critical space technologies is one of the objectives addressed directly in the 2013 call by calling for specific R&D which has been identified as urgent actions by a Joint task force of EC-EDA-ESA. Such concerted and coordinated action is also in line with the Horizon 2020 objective to prioritise areas that could not be effectively realised by Member States acting alone.

Ensuring more extensive utilisation of space data from existing and future generations of Union space systems is another priority identified by Horizon 2020, which is to be addressed in the 2013 work programme, as are the demonstration and validation of new technologies and concepts in the space and terrestrial analogue environments.

In Horizon 2020, it is expected that all societal challenges and industrial technologies shall contribute in their actions to sustainable development and climate related issues. Apart from actions related directly towards climate change issues, actions should also be relevant to the goal that enterprises are to adapt to a low-carbon, climate-resilient, energy and resource-

⁴ International Cooperation Partner Country (ICPC) is a third country which the Commission classifies as low-income, lower-middle-income or upper-middle-income country and which is identified as such in the work programmes, see list in Annex 1 to the Work Programme "Cooperation"

efficient economy. In this respect, also research and development towards sustainable products, e.g. “green fuels”, which will conform to more stringent environmental standards and regulation, is being taken up in the 2013 work programme.

Approach for 2013

The action plan underlying the Space Work programme is based on the European Space Policy. The Work programme responds directly to policy needs expressed in the Communication on EU Space strategy, the European Space Policy Communication, the Resolutions of the Space Council⁵, and follows the recommendations of the Space Advisory Group.

As regards GMES Services, consolidated user requirements established in user consultation processes linked to GMES implementation are also instrumental in providing guidance to the Commission in the annual update of the work programme and of emerging needs, including for GMES information by policy makers. As regards the specific topic of climate and climate change monitoring, space based observations provide a key source of data at global scales of the Earth’s environment, climate change, and the provision of climate services. A conference "GMES for climate change" was held in Helsinki on 16 and 17 June⁶. It explored whether there are still any gaps, and which of these need to be addressed by GMES and should be considered as components of a future GMES climate change service. Following this consultation, the call for 2013 has been prepared to address this important thematic service domain of GMES.

As regards Critical Technologies for European Non-Dependence, the joint task force group (EC, ESA, EDA) has reviewed and updated the list of the most urgent critical technologies thus harmonising the response of the three institutions.

Modalities of Implementation: Research Executive Agency, European Space Agency

Calls for proposals under this work programme Theme Space will be implemented by the **Research Executive Agency** (REA) according to the provisions of Commission Decision C/2008/3980 final of 31 July 2008 “delegating powers to the Research Executive Agency with a view to performance of tasks linked to implementation of specific European Union programmes People, Capacities and Cooperation in the field of research comprising, in particular, implementation appropriations entered in the Community budget”. The management of all projects to be funded as a result of this work programme will be implemented by REA, with the exception of:

- actions implemented on the basis of calls for tenders
- identified beneficiary actions (being in support of policy)
- other specific topics explicitly identified as being of a strategic nature for the European Commission.

⁵ 4th Space Council Resolutions [also COM(2007) 212 final], 22 May 2007; 5th Space Council Resolutions, 25-26 September 2008; 6th Space Council Resolutions, 29 May 2009; 7th Space Council Resolutions, 25 November 2010

⁶ Proceedings of the conference are available at http://ec.europa.eu/enterprise/policies/space/gmes/services/climate_change_conference_en.htm

The **European Space Agency** will not participate in consortia of FP7 proposals submitted under the FP7 “Cooperation” Space Theme to this call for proposals.

Gender dimension

The pursuit of scientific knowledge and its technical application towards society requires the talent, perspectives and insight that can only be assured by increasing diversity in the research workforce. Therefore, all proposals are encouraged to have a balanced participation of women and men in their research activities and to raise awareness on combating gender prejudices and stereotypes. When human beings are involved as users, gender differences may exist. These will be addressed as an integral part of the research to ensure the highest level of scientific quality. In addition, specific actions to promote gender equality in research can be financed as part of the proposal, as specified in Appendix 7 of the Negotiation Guidance Notes⁷.

Activities

Two main activities, complemented by a set of cross-cutting activities, will be undertaken to achieve the policy objectives expressed above, and several specific action areas are prioritised within these activities. However, not all specific action areas will be open for specific call topics in the call during 2012, covering commitment appropriations of 2013.

Activity 9.1. Space-based applications at the service of European Society

The **first activity**, the development of GMES (Global Monitoring for Environment and Security) being central to this activity, covers five main *action areas*:

1. Support to the **(pre-)operational validation of GMES services and products** based on the integration and harmonisation of related observation data (both satellite-based and in-situ, including ground-based, ship-borne and airborne), starting with the funded GMES Services.
2. Integrated use and application of **satellite communication and satellite navigation solutions with space-based observation systems**, and with related non-space systems.
3. **Support to the coordinated provision of observation data**, both from space-based infrastructure and from in-situ observation systems.⁸
4. Development of **Earth observation satellites**, which relate to the management of the environment and security, and which complement in-situ systems.
5. Continuity of **GMES services**, ensuring complementarity and consistency with the GMES Regulation on the European Earth observation programme (GMES) and its initial operations (2011-2013)⁹

During 2013, **four of the five specific action areas above will be prioritised** (namely area 1, 2, 3 and 4), following a strategic approach as follows.

⁷ https://ec.europa.eu/research/participants/portal/page/fp7_documentation

⁸ Coordination and Support Actions for these activities are regarded as policy related actions and will not be managed by the Research Executive Agency (REA)

⁹ OJ, L 276, 20.10.2010, p. 1.

The Work programme 2011 for the FP7 space theme allocated resources already with high priority to the Marine and Atmosphere domains, resulting in service projects aiming at continuity (action area 5), as well as a number of smaller projects meeting R&D needs in these two domains. The Security monitoring service was the main focus of the work programme 2012 in action area 1. Research and development activities undertaken in the FP7 work programmes 2013 under action area 1 will thus focus thematically on R&D needs for the build up of **climate change monitoring services**, stimulating the development of **downstream services and service evolution** and other **earth observation/remote sensing research** to further strengthen the GMES implementation.

As regards **climate and climate change monitoring**, discussions during 2011 and the Helsinki conference have highlighted priorities in the climate change service context. These are to improve Earth System reanalyses to include the hydrological cycle, coupling the ocean and atmosphere, and feedback mechanisms. Issues such as data archiving, integration and access to data through a central clearing house mechanism should also be tackled, as well as implementing a gridded approach to impact indicators. Research topics of the work programme 2013 will be tailored to meet the priorities expressed above.

Support to the coordinated provision of observation data (action area 3) will be addressed in 2013, by making available additional resources through the EC/ESA Delegation Agreement for space data supply to services.

Action area 3 and Action area 4 of development of **Earth observation satellites** will be supported in 2012 and 2013 with a payment transfer from FP7 under the ESA-EU Delegation Agreement.

Activity 9.2. Strengthening the foundations of Space science and technology

For the **second activity**, the strengthening of foundations of Space science and technology, the support is to be maximised through synergies with initiatives of ESA or other European, national or regional entities. This activity comprises three more *action areas*:

1. Support to research activities related to **space science and exploration**,
2. New concepts in **space transportation**, and **key technologies** including **critical components**,
3. Research to reduce the vulnerability **of space assets**.

During 2013 **all three specific action areas** above will be supported, placing the priorities on topic areas which have seen either a high oversubscription in 2012, or topic domains which have not been covered yet in previous years. Earth-analogue research preparing for space exploration is for instance an important area allowing thorough performance validations to be conducted economically on earth before engaging in costly in-orbit validations. As regards Critical Technologies for European Non-Dependence, this topic has not been covered in the Work Programme 2012. The joint task force group (EC, ESA, EDA) has now reviewed and updated the list of the most urgent critical technologies thus harmonising the response of the three institutions. Regarding the vulnerability of space assets, specifically to space weather interference, particular attention has been given to the upstream research needs of Galileo.

Activity 9.3. Cross-cutting activities

The **third activity** comprises a number of horizontal issues:

1. Activities in **SME relevant research** will be embedded *in all the action areas* mentioned. Applications of GMES and other space infrastructures, including Global Navigation Satellite Systems (GNSS), typically require very sophisticated, state-of-the-art processing, which are often the result of research and developments done in specialised academic organisations and commercial spin-offs. Typical opportunities for SME participation in GMES may be found in the development and/or adaptation of methodologies and tools for services tailored for specific applications. Concerning space science, exploration, space transportation and space technologies spin-in and spin-off activities are encouraged. Additionally to this general approach, collaborative projects will be *specifically supported in 2013* under this action area, which bring together SMEs not traditionally working in space projects with space industry or space research organisations.
2. **International cooperation** with third countries (ICPC) will be supported in view of expanding the use of earth observation data, and the corresponding data processing and management methods in third countries, and enhancing the relations with established space powers, with a view to facilitating wider space research alliances. Candidates for cooperation among other established or emerging space powers include the United States, Russia, Canada, Japan, the People's Republic of China, India, Brazil, South Africa, and the Ukraine. The European Neighbourhood Policy governs relations with Eastern and Southern neighbours (i.e. Black and Caspian Sea region) and countries of North Africa and the Middle East (i.e. Mediterranean region).

All projects conducted in the Theme Space are open for such participation of third countries under the normal participation rules, with the topics mentioned above being of particular interest for international participation. Participants are eligible to participate in the context of the Space Theme calls described in this work programme. A specific priority is given in 2013 to cooperation with the Ukraine and China in the specific cross-cutting actions under Activity 9.3.

3. Effective **dissemination actions** are of importance as significant wider benefits are expected to arise from the research projects and actions supported under this programme.
4. **Cross-thematic approaches:** in this work programme, complementarity is ensured with other Themes of the Cooperation Programme. In particular, the topics in Activity 9.1 relating to GMES in this work programme are complemented by work in the Theme 'Environment (including climate change)'. Also the 'Space technologies' topic in this work programme is complemented by activities in the Themes 'Nanosciences, Nanotechnologies, Materials and new Production Technologies', 'Energy', 'Transport' and 'Information and Communication Technologies'.

Actions in order to better understand the opportunities and challenges associated with the **European Space Policy implementation** process will be undertaken, together with road-mapping activities identifying future Framework programme research needs.

II. CONTENT OF CALLS

This section describes all the topics for which proposals will be called in this work programme. This concerns only the content of the calls. For the practical modalities related to these calls, please refer to section III 'Implementation of calls'. For actions not implemented through calls for proposals, please refer to section IV 'Other actions'.

The current planning foresees one call in 2012 covering an annual work programme, for projects to be funded from the 2013 Space theme budget. No further call on these activities is currently planned based on the commitment appropriations of 2013.

Activity: 9.1 Space-based applications at the service of European Society

Area 9.1.1 (Pre-)operational validation of GMES services and products

Three subject areas are being considered, firstly meeting the need to cover the 6th thematic service domain of climate change in GMES, and secondly opening up competition again to downstream service communities.

Towards a GMES Climate change service – preparatory activities

Discussions during 2011 and the Helsinki conference¹⁰ have highlighted priorities in the climate service context, particularly in light of the wide range of climate change relevant activities being supported at all levels, from global to local level. It explored whether there are still any gaps, and which of these need to be addressed by GMES and should be considered as components of a future GMES climate change service. Actions have been prioritised, which are complementary to activities funded by other sources. These are to improve Earth System reanalyses to include the hydrological cycle, a proper coupling between the ocean and the atmosphere, as well as other feedback mechanisms. Issues such as data archiving, integration and access to data through a central clearing house mechanism should be tackled, as well as implementing a gridded approach to impact indicators. The topics proposed in this area support activities leading to the development of initial Climate Change Service elements as identified during the GMES stakeholder consultations and the Helsinki Climate Service conference in 2011.

SPA.2013.1.1-01: Global 20th century re-analysis and coupling methods

¹⁰ Proceedings of the conference are available at http://ec.europa.eu/enterprise/policies/space/gmes/services/climate_change_conference_en.htm

A global 20th century re-analysis covering all components of the earth system is to be undertaken. This will require data recovery and data rescue efforts for early space-based and in-situ observations, as well as the preparation of these observations for inclusion in a climate reanalysis. In parallel, scientific approaches will be favoured, which considerably enhance the description of interactions between different components of the earth system (e.g. atmosphere, land, ocean, cryosphere, carbon cycle, etc). This could be addressed by improving the coupling between some or all components of the Earth system in the background estimates and/or in the analysis step. The goal of the activity is to provide consistent historical climate data records from 1900 until 2012 at improved spatial and temporal resolutions, spanning the satellite and pre-satellite era records in a consistent manner.

Links should be made to existing projects which are improving the quality of in-situ and space-based observational data sets (reprocessing) as well as providing new data from sometimes non-digital sources (data rescue). Reanalysis starting in 1900 has to rely on uncertain input data subject to various data correction schemes, and hence activities must be included to quantify the resulting uncertainty in the resulting historical records, e.g. by using an ensemble approach.

Such a reanalysis will generate an archive containing potentially several petabytes of gridded data, and these must be made easily accessible to a large number of users. Efficient web-based data services and versatile visualisation services will have to be realised.

Proposals will have to include efforts to liaise with other ongoing projects, including those selected under the other topics of this area, and other projects such as the ESA Climate Change Initiative (CCI) and EUMETSAT Central Applications and distributed satellite application facilities network including the climate monitoring Satellite Application Facilities (CM-SAF), in particular in the area of data access, data formatting, and space data processing, in order to avoid duplications and exploit synergies. For the marine area, projects must reinforce and build on standards, protocols and catalogues developed in the ongoing collaboration between the European Marine Observation and Data Network (EMODnet) and the GMES marine service.

- Expected impact:

The project is expected to significantly contribute toward capacities in the climate change context of GMES by providing consistent datasets of climate relevant parameters on a global scale for all of the 20th century. This 4D data set will support (in combination with climate model predictions) climate change impact and adaptation action assessments, policy development and policy monitoring for global, European and national users. It will also be an important asset for the development of downstream sector specific climate application services.

Funding schemes: One Collaborative project with an upper eligibility limit of EUR 7 000 000 requested EU contribution (up to one proposal can be selected).

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria.

SPA.2013.1.1-02: Ensemble system of regional re-analyses

An ensemble system of regional re-analyses should be developed, together with the necessary tools to statistically assess the information content of resulting probabilities, and how best to utilise this additional information for understanding past climates and climate change.

The ensemble technique is a well accepted simulation approach to quantify uncertainties in atmospheric modelling. It is being used in order to quantify the spread related to uncertainties inherent in historic data sets, which in turn provide an improved set of boundary conditions. At the same time, different regional reanalysis data sets are being developed by European consortia (for example EURO4M and other FP7 projects) and also through national activities. Both are providing a wealth of information reflecting uncertainties, which are crucial for the interpretation of the reanalysis output or derived indicators. An ensemble of regional reanalyses should be developed in order to optimally exploit the results of different regional reanalyses for best describing uncertainties in the historic records at regional levels. Scientific approaches which enhance the description of interactions between different components of the earth system in the individual models are welcomed.

To enhance quality, statistical uncertainty methods need to be developed to improve exploitation and account for sparse observations in the pre-satellite era. Based on the results of uncertainty levels, efforts should also be included on how to quantify uncertainties of impact indicators which are most relevant to the development and assessment of policies.

Overall, such a re-analysis will generate an archive with large amounts of gridded data; these must be easily accessible by a large number of users, for scientific and policy use. Efficient web-based data services, as well as versatile visualisation services will have to be realised.

Proposals will have to include efforts to liaise with other ongoing projects, including those selected under the other topics of this area, in particular concerning data access and data formatting, in order to avoid duplications and exploit synergies.

- Expected impact:

The project is expected to significantly contribute towards capacities in the climate change context of GMES by providing consistent long term datasets of climate relevant parameters on a regional scale. This will substantially support (in combination with climate model predictions) climate change impact and adaptation action assessments, policy development and policy monitoring for European and national users. It will also be an important asset for the development of downstream sector specific climate application services.

Funding schemes: One *Collaborative project* with an upper eligibility limit of EUR 5 000 000 requested EU contribution (up to one proposal can be selected).

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria.

SPA.2013.1.1-03: Traceable quality assurance system for multi-decadal ECVs

R&D towards traceable multi-decadal Essential Climate Variable (ECV) records is to be performed. The goal of this activity is to develop rigorous quality assurance methodologies for satellite-derived ECV products. These methodologies, which may be specific to individual ECVs or groups of ECVs, should be based on the concept of traceability as it is used in metrology. Furthermore, the methodologies should be applied to a small number of satellite-derived ECV records, which are to be generated in a consistent manner across timescales close to or exceeding 30 years in length, in order to assess compliance with the Global Climate Observing System (GCOS) quality criteria. Proposals should not duplicate efforts currently addressed by ESA's Earth Observation (EO) programmes or EUMETSAT Central applications and distributed Satellite Application Facilities including Climate Monitoring (CM-SAF). Proposals will have to address both parts of the problem, which are closely interlinked.

1. Developing traceable quality assurance methods for ECVs:

The reference quality standards for ECVs are formulated (and updated) by the GCOS. Compliance of ECV datasets with these accuracy criteria is crucial and must be verified independently. The goal of this activity is to develop traceable approaches (whether building on modelling efforts or by other means) that allow to evaluate the quality of satellite-derived and in situ-measured ECV products and algorithms – ideally at the level of individual pixels or in situ locations, respectively – via an unbroken chain of comparisons to certified reference standards. Of particular interest here (although not limited to) are ECVs that are the result of a combination of parameters or algorithms rather than being directly measurable with satellite and in situ observations.

In addition to adhering to sound metrological practices, the proposed quality assurance methodologies should adapt to whatever ECV definitions are being used by satellite and in situ retrieval algorithms. Ideally, they should also be capable to deliver reliable assessments on the merit of a given ECV retrieval algorithm prior to its implementation and the (re-)processing of large volumes of satellite data. Physical measured parameters should wherever possible be traced to reference standards of SI derived units (derived from the International System of Units). As a practical test, the proposed quality assurance methodologies should be applied to the ECV records delivered under item 2 below in order to assess their compliance with the GCOS criteria.

This activity should aim at providing information on the quality and "fit for purpose" nature of the respective climate dataset as potential important metadata for policy relevant information in the context of the EU Climate Adaptation Platform, Climate-ADAPT (www.climate-adapt.eea.europa.eu).

2. Generating multi-decadal satellite-derived global ECV records:

Consistent quality-assured satellite-derived global ECV products spanning multiple decades are essential to improve our knowledge about climate change, its causes and consequences, as well as to optimise not well understood process descriptions in models. These climate records may also serve in the validation of models and as basis for the development of reliable impact indicators for policy makers. The goal of this part of the activity is to generate new long-term ECV records on the basis of satellite

observations. As such, proposals should focus on ECVs that fall outside the products generated by ESA's CCI initiative and that are not covered by the EUMETSAT Central applications and distributed Satellite Application Facilities including Climate Monitoring (CM-SAF).

More specifically, historical records of a few quality-assured ECV products should be generated in a consistent manner on the basis of appropriately (cross-) calibrated satellite observations and ideally operational retrieval algorithms that can be customised to multiple space sensors including those of the upcoming sentinels. The generated ECV records should be global in scope and close to (or exceed) 30 years in length. The emphasis of this activity lies with the quality (and not the quantity) of long term ECV data records that are to be generated within the project. The final ECV products and retrieval algorithms should be verified with the traceable quality assurance methodologies described under item 1 above and made available via dedicated web-interfaces and visualisation tools.

Proposals will have to include efforts to liaise with other ongoing projects, including those selected under the other topics of this area, dealing with data access, data formatting and the generation of climate indicators in order to avoid duplications and exploit synergies.

- Expected impact:

Projects are expected to contribute toward the (pre-) operational capacities in the climate change context of GMES, by augmenting the number of currently available quality-assured long term ECV records and by providing methodologies suitable for reliable assessments of the climate quality of ECV products. This will substantially support (in combination with climate model predictions) climate change impact and adaptation action assessments, policy development and policy monitoring for global, European and national users.

Projects are furthermore expected to contribute towards the standardisation aspect of Europe2020, namely by delivering robust and cost-effective quality assurance procedures for satellite-derived EO products and their in situ validation efforts.

Funding schemes: One *Collaborative project* with an upper eligibility limit of EUR 5 000 000 requested EU contribution (up to one proposal can be selected).

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria.

SPA.2013.1.1-04: Provision of access to simulated and observed climate datasets and climate indicator toolbox

This activity is to perform R&D towards a climate indicator service. The goal of this activity is to develop a web-based platform in support of impact indicator developments, comparisons and rankings on the basis of direct access to in situ, satellite-derived and model-generated data and products. Proposals will have to address both parts of the problem, which are closely interlinked:

1. Provision of access to simulated and observed climate datasets – building on existing efforts and on-going initiatives, an internet based one-stop-shop is required that provides access to model generated as well as satellite and in-situ based INSPIRE-compliant climate relevant data sets. For the marine area, projects must reinforce and build on standards, protocols and catalogues developed in the ongoing collaboration between the European Marine Observation and Data Network (EMODnet) and the GMES marine service. This activity should account for the considerable increase in climate relevant data volumes which are being generated due to better resolutions and the increasing use of ensemble techniques. Such climate data derives from both in-situ and remotely-sensed observations as well as through numerical modelling for all components of the earth system.

Hence efforts should be made to technically facilitate the access to the observation and modelling results, including data formats, compression techniques, condensed description of ensemble information, and their visualisation. At the same time the activity should provide a knowledge base for the academic world as well as for policy makers in support of mitigation and adaptation, both in terms of system concept and the access provided to data repositories within the time span of the project.

The final system should allow for climate model output, re-analysis datasets, impact indicators, as well as in-situ and satellite data and products to be extracted from their respective locations via a single interface – containing advanced geospatial and temporal search tools – and made available to the user in a common grid format. The final system should enable the climate indicator toolbox described below. Furthermore, metadata describing the quality or "fit for purpose" nature of information should be included in this activity. In addition, the activity should explore how to best link the wealth of climate data sets to the EU Climate Adaptation Platform, Climate-ADAPT (www.climate-adapt.eea.europa.eu) and provide practical solutions.

2. Developing a climate impact indicator toolbox – the overall goal of this part of the activity is to develop efficient and user-friendly statistics tools for the generation, comparison and ranking of gridded INSPIRE-compliant climate impact indicators at local, regional and European scales on the basis of satellite, in situ and re-analysis datasets, as well as auxiliary (e.g. socio-economic) information (if available in suitable data formats). Software tools for improved characterisations of extreme events (e.g. their likelihood, intensity and change in frequency) should be developed. At the same time it should be possible to build new indicators, compare them to existing ones and identify the strengths and weaknesses of each method. Ideally, these efforts should make use of the uncertainty information associated with the input datasets whether these were obtained from in situ measurements, satellite observations or model simulations/re-analyses. The goal should be to generate, compare and deliver robust indicators - having well documented associated uncertainties - that are relevant for the development and assessment of policies.

The activity should apply the developed tools to indicators defined in the context of existing EU and/or national adaptation strategies, in order to closely link the activity to the demands of policy users. Appropriate provision of this information to the EU Climate Adaptation Platform, Climate-ADAPT (www.climate-adapt.eea.europa.eu) should also be addressed.

Proposals will have to include efforts to liaise with other ongoing projects, both for data access and data format definitions as well as for the generation of climate indicators, in order to avoid duplications and exploit synergies. The overall impact of the system should be measured by users, in particular regarding ease of access, generation of new indicators and the ranking of existing ones.

- Expected impact:

Projects are expected to significantly contribute toward the (pre-)operational capacities in the climate change context of GMES, in particular, by delivering a one-stop-access point to EO products, re-analysis data, climate model output and in situ observations, and thereby enabling the development, generation, comparison and ranking of climate impact indicators. It will also ensure that the expanding climate-relevant data volumes can be readily accessed and processed into higher level information products by a broad interdisciplinary community.

Funding schemes: One *Collaborative project* with an upper eligibility limit of EUR 6 000 000 requested EU contribution (up to one proposal can be selected).

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria.

SPA.2013.1.1-05: Attribution products

A series of attribution products are to be developed by using a climate model to determine the expected response to a particular climate forcing. Model projections (at regional and/or global level) are to be performed with different climate forcings; i) with natural forcings (solar radiation and geological factors) only; ii) with natural and anthropogenic forcings. Differences in the projections can then be attributed in a probabilistic manner to the effect of anthropogenic forcing. This activity should study a number of historical cases, related to flooding, droughts and storm surge events, and identify as to whether (and what) anthropogenic factors may have contributed to their occurrences. The activity should provide evidence as to whether the risk for a similar event has increased, decreased or remained stable. It should also propose exhaustive diagnostics of climate processes for cases under study and list areas where the science, or observables (their coverage, or precision), are still too uncertain to make a robust assessment of the change in risk. Where there are gaps identified, an identification of the observation concepts required would be valuable.

- Expected impact:

The project is expected to significantly contribute toward the (pre-)operational capacities in the climate change context of GMES by providing information on how likely high impact environmental disasters are attributable to natural climate variability or human-

induced effects. This should enable the growth of a downstream service sector. Additionally, the methodology developed by this project in order to quantify the enhanced risks of extreme climate states and severe weather events is expected to contribute to the development of climate change adaptation strategies, both for commercial activities as well as policy initiatives.

Funding schemes: One *Collaborative project* with an upper eligibility limit of EUR 3 000 000 requested EU contribution (up to one proposal can be selected).

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria.

GMES service activities

Apart from preparing the ground for a GMES climate change service, the work programme in 2013 further expands the development and evolution activities of downstream services, supporting also the development of up to date remote sensing algorithms and methodologies needed to enable future service products.

SPA.2013.1.1-06: Stimulating development of downstream services and service evolution

Apart from satisfying information needs by policy makers, innovative commercial geo-spatial products and geo-information services are key to economic return on the major space investments made in earth observation, and directly aim at enhancing the competitiveness of European value-adding and geo-information service industries. Creating innovative services not only leads to improvement of European competitiveness, but also enables sustainable development.

Research and development on next generation products and service lines derived from space-borne data in conjunction with in-situ data is to be targeted. Particular attention is to be given to the presence of the GMES investments in the Sentinel satellites expected to be launched on a 2013/2014 time horizon, and the presence of the GMES services in land, marine and atmosphere domains. Exploitation of GMES data should be considered in the widest context, for institutional, commercial or for scientific use.

Existing and validated experimental practices or methodologies need to be turned into operational prototypes in a close interaction and trade-off/validation process with the service users. Projects should be strongly user driven and take into account user needs concerning information and services, quality specifications, and orient themselves along existing guidelines established in previous GMES projects and by advisory bodies at European level. Successful integration into current user practices and their working environment need to be demonstrated. For example, activities could target application areas of:

- Agriculture and agri-environment, crop monitoring, precision farming,
- Monitoring of critical infra-structures, vulnerable to man-made and natural hazards,

- Renewable energy production and energy efficiency management,
- Environmental and Climate change impacts and attribution,
- Maritime and other transport activities, including for instance end-to-end maritime supply chain security,
- Health services, monitoring conditions for vector borne diseases or other health risks derived from environmental factors,
- Atmospheric pollution/air quality monitoring and forecast,
- Soil organic carbon monitoring,
- Water cycle monitoring,
- Support to marine monitoring activities (e.g. monitoring of living marine resources) and coastal environment monitoring

Proposals addressing other application areas are also welcome.

Downstream services strive to build up the pre-operational delivery capabilities, and hence proposals must demonstrate:

- **A structural capacity for providing a sustainable service on an operational basis (preferably supported through a proven record).**
- **A clear focus on the operationalisation of services, and thus sustainability of the service during subsequent operations, by defining and further consolidating the economic model for service provision (e.g. through a business plan).**

Therefore, the following elements will be considered in the evaluation of the proposals:

- A demonstration of a user-driven approach, including for instance:
 - A user representation appropriate to the targeted products and user communities, as well as a suitable mechanism to interact with these (participation of users as project's partners would be favourably considered or, as a second preferred option, the set-up of service level agreements could be considered¹¹).
 - A process for elaborating requirements closely with the users, including:
 - The specification of quality requirements and tolerance levels (explicit and well-defined precision, reliability, availability and integrity requirements for the products/service).
 - An unambiguous, detailed and realistic list of products to be delivered to the users: product description, time period and geographical coverage, delivery dates.

¹¹ A template is available as part of 6th SPACE call documents to be found at <https://ec.europa.eu/research/participants/portal/page/cooperation>

- A process for monitoring how activities (of research, development, demonstration, system implementation, service validation and data provision) trace back to the user requirements.
 - A process for feedback from and assessment of the service *by relevant end-users*, which demonstrates both the acceptance level of the products, the prototypical service, as well as a strategy for integration into the users' workflows and resulting decision-making processes.
- A description of the organisation and service architecture, including interface / coordination to be assured with the GMES services providers if relevant.
 - A description of procedures for collection of observation data (satellite, in-situ) and delivery, under consideration of both organisational aspects, as well as technical solutions offered by state-of-the-art communication methods (via terrestrial or satellite communication channels). Account should be taken of possible mechanisms of coordinated data delivery.
 - A description of selected methods for data validation and fusion from multiple sources; techniques for data assimilation into models, validation of space derived products by means of in-situ data.
 - A preliminary analysis of the added value of products derived from GMES services,
 - A preliminary version of a clear and scientifically sound validation plan including detailed methods for measuring quality of products, their viability¹², and describing the test sites and their selection criteria.
 - A description of the approach for achieving interoperability and interconnection of the data processing and delivery systems, taking into account harmonisation policies, directives such as INSPIRE, and standardisation initiatives (While demonstrating interoperability capabilities, also gaps and shortcomings may be identified which have then to be integrated in ongoing INSPIRE efforts. Furthermore, the impact of harmonisation and the INSPIRE implementation on the sustainability of the services could be examined). To facilitate efficient acquisition and exploitation by both service providers and users, activities will have to include R&D¹³ for:
 - improved accessibility to long-term data archives, implementation of meta-data standards, actions to facilitate information retrieval and dissemination;
 - improved accessibility to in-situ systems;
 - adoption of open standards for data documentation, data models and services;
 - integration of tools and services allowing anybody to query, view, access and exchange the information held by distributed public and private bodies;

¹² It should be noted that activities designed to prove the viability of new technologies that offer a potential economic advantage, but which cannot be commercialised directly, **correspond to “Demonstration” activities rather than “Research and Development” activities** in the Framework Programme. Proposals should therefore provide a careful separation of these two types of activities in their work plan.

¹³ It should be noted that specific development and research on ICT for environmental management as well as mechanisms for rapid adoption of standards, protocols and open architectures are undertaken in FP7 theme 3 “Information and Communication Technologies” under Challenge 6 “ICT for Mobility and Environmental Sustainability”.

- establishment of a data policy and appropriate security framework.

Projects should include activities aiming at disseminating knowledge and increasing public awareness of the results achieved through the integration of space technology and in-situ observation systems. Project output could include an assessment of the type of data and level of spectral, spatial and time resolution expected from the next generation of satellites and in-situ data sources.

Space-based observation data necessary for the development of each project will have to be detailed in the proposal. In particular, the proposal should highlight the Earth Observation Data expected to be made available through the EU funded data access mechanisms via ESA¹⁴. Concerning the latter, proposals should provide an overview of resources needed for space-based observation data, as data requirements beyond the existing agreement between the Commission and ESA will have to be covered by the budget of the project.

With regard to **in-situ data** necessary to the development of each service, the proposals will have to foresee dedicated efforts for their provision, allowing for an interface with coordination activities of the European Environment Agency (EEA) in this respect¹⁵.

In general in-situ data could include:

- (i) data collected by networks of sensors deployed on land, sea, water and in the atmosphere aimed at measuring and providing a complete description of the Earth system.
- (ii) surveys aimed at collecting socio-economic data, land cover and land-use data, geology, soil conditions, bio-diversity information and other topographic or geographical data such as elevation, administrative boundaries, transport and utility networks etc.

In particular in-situ data should meet the immediate needs of the specific proposed service and should cover, inter alia, the following requirements:

- Timeliness, in function of the service requirements;
- The provision schemes and their corresponding delivery interfaces (FTP, other internet protocols, dedicated communication schemes).

Specific needs for dedicated in-situ data for the development of each service should be detailed in the proposals. The proposals should provide an overview of in-situ data requirements and if specific data will have to be covered by the budget of the project.

The participation of SMEs is particularly encouraged for this topic of the call; while not being compulsory, this aspect will be taken positively into account in the evaluation.

- Expected impact:

The projects are expected to establish innovative new GMES service capacities targeting specified user communities. In the context of already existing capabilities, projects are expected to contribute to the integration of new service lines into service chains of GMES downstream services.

¹⁴ Data Warehouse Requirements Document v1.8 dated 30/05/2011

¹⁵ FP7 project 249327, GMES In-Situ Coordination (GISC)

The proposals are expected to have a demonstrable impact of the proposed service on the operations and capacities of the involved user communities. The resulting projects are expected to show significant uptake of products and to conclude on suitable business models for long-term operational supply. The developed services are consequently expected to be self-sustainable from an economic perspective when EU funding ends. Strong evidence that the involved user organisations are likely to pay for the service after the end of the project should therefore be given. Significant progress to establishing a directory of users likely to be willing and capable to pay for the service should also be demonstrated.

The evolution and trends of future sensor needs shall be demonstrated. The results obtained shall contribute directly to the sustainability and competitiveness of European value-adding services.

The proposals are expected to enhance the European industry's potential to create and take advantage of important market opportunities and to establish leadership in the field, giving due regard to the impact that the products and services could have in a socio-economic context. The projects are thus expected to reflect the mutual dependency of technology, organisational dynamics, societal issues as well as related legal/economic aspects. Furthermore, projects are expected to ensure sufficient awareness and understanding of all relevant issues for the take-up of their outcome.

Projects are expected to boost downstream service and business activity, to be achieved through close collaboration with representative user communities throughout Europe. To enhance the impact on GMES activities in Europe overall, the projects are expected to take into account and build upon relevant past and ongoing activities in the field. Optimum use of existing products and services or other project results is therefore expected.

The impact of the validated system should also be demonstrated through pilot tests and exercises, based both on simulation data and on real events, where appropriate.

Funding schemes: Collaborative projects with an upper eligibility limit of EUR 2 500 000 requested EU contribution.

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria.

SPA.2013.1.1-07: Remote sensing methods

Progress in remote sensing applications can be made by improving object based analysis and other automated interpretation processes, and/or combining information from different sensors in novel ways, examples being :

- Improved information extraction and change detection from combined use of different sensors, such as radar, thermal infrared and/or optical imagery (from ultraviolet to shortwave infrared) and infrared and/or optical spectrometry;
- Water cycle monitoring from combined use of different Sentinel data;

In projects dealing with multi-temporal analysis of Sentinel-similar data sets, the ones dealing with improvement of the geometric and radiometric matching between Sentinel data and previously launched similar missions (e.g. Landsat) would be favoured.

The operational availability from Sentinel satellites, expected to be launched on a 2014 time horizon, will be of particular significance in this respect.

Provision of next generation geo-information services and products also benefit greatly from new methods which exploit the physical observables accessible from space. In this respect, radiometry for soil moisture and ocean salinity, or novel use of Lidar measurements could be addressed.

The growing availability of hyper-spectral data allows better environmental observations from space, and activities could target for instance:

- The use of hyper-spectral based information for better ecosystem analysis. Progress has been made in recent years in combining various satellite-borne data for assessing ecosystem quality and functions, but fundamental gaps persist. Research is needed to explore which spectral and assessment methodologies can be successfully combined for receiving hitherto still inadequate information on the type, quality, state, degradation and restoration possibilities of ecosystems, and on how far ecosystem functions can also be assessed via satellite interpretation.
- The use of hyper-spectral information for remote geological analysis of soil quality and soil degradation. Soil spectral libraries are being built at both national and European scales. They contain spectra that are strongly correlated with key soil properties (e.g. carbon and clay content). Research in advanced data processing techniques is needed in order to link these libraries with hyperspectral remote sensing products for the extraction of topsoil properties under varying surface conditions, taking into account spatio-temporal variation in moisture, roughness and vegetation cover. Research could also address the use of hyperspectral imagery in operational Digital Soil Mapping and Digital Soil Assessment.
- The use of hyper-spectral imagery in water resources analysis and inland or coastal water quality characterisation, with particular attention to the proper integration with classification and modelling methods.
- The use of hyper-spectral information for detailed analysis of remote sensing data of natural vegetation and crops. A large amount of forest and crop data has been collected across Europe during the last decades. Furthermore, some airborne initiatives are being used. New hyper-spectral images, combined whenever possible with Lidar data, can be an enormous leap forward if properly modelled using the current “ground truth”.

With some 150 GNSS satellites to be available in the next future, the use of GNSS signals for non-navigation purposes represents a further domain in which novel sensing applications are possible, like GNSS Reflectometry (GNSS-R), GNSS Radio Occultation (GNSS-RO), GNSS tomography etc...., using both space and ground infrastructure. These new applications of GNSS have the potential to be exploited to yield information in many GMES areas, like

marine (e.g. sea-surface roughness, ice characteristics), Climate change monitoring, Land (e.g. soil moisture or biomass content), Atmosphere (e.g. water vapour or carbon hot spots) or even Emergency (e.g. Tsunami detection) etc...

New methodologies or service concepts demonstrating improved performances with respect to existing earth observation methods are particularly welcome.

Proposals are invited which investigate promising new application areas.

- Expected impact:

The projects will be expected to establish a basis for the development of innovative new GMES products or applications combining in a novel manner existing and upcoming sensor data and in-situ data. Projects are also expected to demonstrate that improved service performances are achievable by applying innovative remote sensing methods. Finally, project results are expected to substantiate the needs for new observation techniques to be implemented in the next generation of observation satellites. The impact of the validated system should also be demonstrated through pilot tests and exercises, based both on simulation data and on real events, when possible and appropriate.

Funding schemes: Collaborative projects with an upper eligibility limit of EUR 2 000 000 requested EU contribution.

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria.

Area 9.1.2 Integration of satellite communication and satellite navigation solutions with space-based observing systems

SPA.2013.1.2-01: Integrated downstream service activities and applications

The objective is to support the development of pre-operational services which integrate satellite communication and/or satellite navigation solutions with space based observing systems in innovative products. Therefore, they shall demonstrate:

- A structural capacity for providing a sustainable service on an operational basis (preferably supported through a proven record).
- A clear focus on the operationalisation of services, and thus sustainability of the service during subsequent operations, by defining and further consolidating the economic model for service provision (e.g. through a business plan).

The outcome of the project should be a pre-operational service platform, with the objective of validating the technological concepts and acknowledging the benefits of an integrated communication / navigation / observation infrastructure with the users, for instance in the areas of prediction/early detection of emergencies, alerting populations (e.g. Tsunami warning). The validation of specific prototypes, based wherever possible and appropriate on

real situations, is encouraged. The overall objective is to provide the end-users with all the required information in a seamlessly integrated, timely, secure and user-friendly fashion. Exploitation of GMES data should be considered in the widest context, for institutional, commercial or for scientific use. Thus possible users could be in small companies, national or local authorities and agencies, and universities.

Complementarities of the satellite capabilities with terrestrial capabilities, where appropriate, should be assessed on the basis of a medium to long term view, based on the foreseeable evolution of space-borne and terrestrial communication (e.g. optical communications) and navigation technologies (in particular relevant developments in the Galileo and European Geostationary Navigation Overlay Service - EGNOS systems). Optimisation and customisation of service platforms and their interface with the Galileo/GNSS system and existing service centres will need to be addressed. The related economics should also be addressed as an integral part of the proposed action. This way, the already multifaceted and integrated nature of GMES, which brings together data from a variety of space-based and in-situ measuring systems, will be further enhanced and enriched by complementary space techniques. To this purpose, account will be taken of the latest development in relevant communication and navigation technologies as identified before.

Space-based observation data necessary for the development of each project will have to be detailed in the proposal. In particular, the proposal should highlight the Earth Observation Data expected to be made available through the EU funded data access mechanisms via ESA¹⁶. Concerning the latter, proposals should provide an overview of resources needed for Space-based observation data, as data requirements beyond the existing agreement between the Commission and ESA will have to be covered by the budget of the project.

- Expected impact:

Projects will be expected to contribute to the development of a service platform, aiming at validating the technological concepts and demonstrating the benefits of an integrated communication / navigation / observation infrastructure with the users. Where novel communication technologies are integrated to upgrade existing service lines, significant advances in quick and inexpensive access to real-time EO data for governmental, civil protection management, and commercial end-users are expected. Projects will be expected to highlight the socio-economic impact of such integrated applications, their challenges and their benefits.

The impact of the validated system must also be demonstrated through pilot tests and exercises, based both on simulation data and on real events, when possible and appropriate.

Funding schemes: *Collaborative projects* with an upper eligibility limit of EUR 2 500 000 requested EU contribution.

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria.

¹⁶ Data Warehouse Requirements Document v1.8 dated 30/05/2011

Area 9.1.3 Support to the coordinated provision of observation data

This part will **not be open** for specific call topics in 2013.

Area 9.1.4 Development of Earth observation satellites

This part will **not be open** for specific call topics in 2013, as this activity is covered by **the EU-ESA Delegation Agreement**. Specific funding support is provided by the theme Space of the 2013 work programme.

Area 9.1.5: Continuity of GMES services in the areas of Marine and Atmosphere

This part will **not be open** for specific call topics in 2013, as these topics were covered in 2011.

Activity: 9.2. Strengthening the foundations of Space science and technology

Area 9.2.1 Research to support space science and exploration

The Call will focus on two subject areas, namely the exploitation of space based data (space physics, astrobiology, planetary science, astronomy, astrophysics, health ...) and Earth-analogue research preparing for space exploration.

SPA.2013.2.1-01 Exploitation of space science and exploration data

Space based observations play a leading role in Earth, Planetary, Universe, Environmental, Physical and Life sciences, providing a privileged vantage point of our planet and objects of the universe, especially when taken in synergy with ground based observations, data analysis and modelling tools and other research in laboratories. ESA has supported many science missions (see in particular data available at the European Space Astronomy Center (ESAC)¹⁷), but data analysis beyond the execution of the mission remains limited. Collaborative proposals in the field of further data analysis and data exploitation are of particular importance. Missions have produced in the past and are currently producing data sets of immense value for research, and the funding support from FP7 should add to this value through a more comprehensive interpretation.

A focus is to be given to **research, analysis and presentation of data obtained from space missions**, exploiting such space mission data in combination with data collected from ground based observations/data. Research and analysis projects are not only intended to strengthen cooperation on scientific problems, which are relevant to our understanding of space, and advance our ability to perform further activities in space, but could also address earth science issues for which the analysis of space collected data provides breakthroughs.

Proposals should clearly demonstrate how their proposed combination of data sets, from multiple instruments or mission sources, including combinations of space and non-space based data e.g. from terrestrial space observatories like European Southern Observatory (ESO) or the Canary's Islands observatories, leads to strong synergies, and adds value to the data obtained in space.

Projects should enhance the effectiveness and productivity of the European scientific community, and promote the contribution of space assets to scientific and technological knowledge, through:

- mobilising the best expertise, in particular academic researchers and scientists, in various fields of science for the analysis and interpretation of space data, selecting the most innovative and challenging objectives in emerging scientific fields;
- extending the usage of available space data (including archived data), also through comparative benchmarking of existing data collections;
- developing better tools to access, analyse, process, validate, archive and distribute data obtained from different sources such as space observatories;

¹⁷ See <http://archives.esac.esa.int/>

- supporting the preparation of data exploitation of missions under development, which might need special tools for data acquisition and processing, in light of the wealth and variety of data they will collect, including ground-based auxiliary data where relevant;
- developing comprehensive presentation and visualisation techniques, preferably in 3D, in order to better understand the interrelations between different sources (sensors) and modes (temporally, spatially).

This topic is open to international cooperation and should focus on downstream R&D activities complementing space missions, such as the effective scientific exploitation of existing data. Cooperation with international partners from third countries (ICPC) , or countries which have signed an agreement with the EU covering Science and Technology, as well as other space-faring nations (e.g. US, Japan) will help to expand the use of data, the corresponding data processing and management methods in third countries, and enhance research partnerships with emerging or established space powers. Therefore such international partners will be eligible to participate and to be funded and this aspect will be taken into account in the evaluation.

- Expected impact:

Projects are expected to add value to space missions and earth based observations by significantly contributing to the effective scientific exploitation of collected data. They are expected to enable space researchers to take full advantage of the potential value of data sets. Projects are expected to expand the use of data, and/or contribute to dissemination of space mission data on a global scale, and/or enhance the relations with established international space powers.

Projects are expected to contribute to the much needed coordination and exploitation of existing and future data collections from space missions, and coordination with ground based observatories, and thereby enhancing the possibility to base research on datasets providing comprehensive or full coverage, while at the same time addressing the potential need for further analysis of existing datasets. It is also expected that the projects will facilitate access to, and appropriate use of data for those scientists who were/are not part of the team having obtained the space mission data (e.g. principal investigators).

Furthermore, projects are expected to add value to existing activities on European and national levels, and to raise the awareness of coordination and synergy efforts among stakeholders.

Funding schemes: *Collaborative Projects* (small or medium-scale focused research project) with upper eligibility limit of EUR 2 500 000 requested EU contribution per project.

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria.

SPA.2013.2.1-02: Earth-analogue research preparing for space exploration

Besides the existing ESA's exploration programmes (International Space Station ISS scientific activities, ESA's robotic exploration missions), research on Earth to prepare for future exploration missions will be fostered in two main areas. This will improve the understanding of feasibility of activities in space:

- (1) First, the **validation of systems and components and their functionality in space environments** is a key development step needed in preparing technology for space use. In-orbit testing is however costly and thorough performance validations are conducted as far as possible at an early stage in field tests here on Earth. Environments are chosen that have physical similarities to extreme space environments.

This is particularly applicable for complex robotic systems, where prototype rover configurations are exposed to challenges similar to those faced on planetary environments. Proposals are invited to address specific challenges which could encompass research and development including test facilities on representative fields and field campaigns in representative environments, to address for example:

- Precision landing, thermal shielding, guidance, navigation and control, obstacle avoidance, path planning, stereo vision, advanced optical systems and detectors, autonomous manipulation (e.g. sampling tools, drilling for subsurface samples, containerisation), mother-slave cooperation between orbiters/rovers, robots/rovers or between human/robots, or power efficient motion;
- recycling, waste and water management or regenerative life support systems under simulated mission conditions;
- provision of mission-analogue reference ("Ground Truth") data for the community, stemming from earth-based field campaigns, to enable efficient testing by scientists, mission engineers, academics and students, as well as to verify simulations.

- (2) The second aspect of "earth analogue" is related to the **research on life in extraterrestrial environments**, which addresses the possible habitability of extraterrestrial environments, survivability of organisms in such environments and sustainability of life, including humans, beyond Earth.

The long-term response of organisms to environmental parameters such as radiation levels, gravity levels, space vacuum, pressure and temperature, as well as different surrounding chemical compositions can be observed in extreme environments on Earth.

In order to prepare for instance for searches of life to be conducted in space, extreme environments on earth allow:

- definition of limits of life and the habitability potential of organisms in extraterrestrial environments
- refinement of search methodologies and strategies including operational concepts in conditions similar to those expected on distant planets;

- detection of specific adaptations of life forms under extreme conditions to obtain further insights on what could be expected in life forms (including life forms other than those known to exist), or traces thereof, in space;
- search for bio-signatures of non earth-centric life forms;
- recognition of biogeomorphological features in data handling and exploitation.

Proposals focussing on such aspects are invited.

Human performance in space is strongly affected by both biological health and psychological factors. Proposals are invited to be conducted on earth, which look at multidisciplinary aspects such as psycho-physiological parameters determining human performance and well-being in space, and means to monitor these during space missions.

The inclusion of international partners is to be particularly encouraged for this topic of the call, as well as the interdisciplinary nature of the R&D to be undertaken. Cooperation with international partners from third countries (ICPC), or countries which have signed an agreement with the EU covering Science and Technology, as well as other space-faring nations (e.g. US, Japan) will help to enhance research partnerships with emerging or established space powers. Therefore such international partners will be eligible to participate and to be funded and this aspect will be taken into account in the evaluation.

The proposals should show that the research work will have an impact on future or ongoing space activities and whether the experiments could eventually be conducted in real space environment (e.g. on the International or Chinese Space Station).

- Expected impact:

Projects are expected to contribute to space readiness of technologies and validation of approaches taken for conducting space missions. A further impact is expected through their potential interdisciplinary nature, in bringing together researchers from different disciplines. A valuable impact is the enhancement and broadening of research partnerships, also beyond Europe in an international context. Projects should contribute to forging new research alliances, which could either be with established international space powers, or with other parts of the world offering access to environments with physical similarities to extreme space environments.

Furthermore, projects are expected to add value to existing activities on European and national levels, and to raise the awareness of coordination and synergy efforts among stakeholders.

Funding schemes: *Collaborative Projects* (small or medium-scale focused research project) with upper eligibility limit of EUR 2 500 000 requested EU contribution per project.

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria.

Area 9.2.2: Research to support space transportation and key technologies

SPA.2013.2.2-01: Space critical technologies

The space sector is a strategic asset contributing to the independence, security and prosperity of Europe and its role in the world. Europe needs non-dependent access to critical space technologies, which is a conditio-sine-qua-non for achieving Europe's strategic objectives. "Non-dependence" refers to the possibility for Europe to have free, unrestricted access to any required space technology.

Critical Technologies for European Non-Dependence are not restricted only to specific electric or electronic components, but include all those technologies which are surveyed and monitored by the Joint EC-ESA-EDA task force on Critical Technologies encompassing platform, payload and launcher technologies. A number of priority technologies have been identified for FP7 support from which proposers can choose (see table below).

U1	Space qualification of low shock non-explosive actuators
U2	Advanced thermal control systems
U3	Propellant flow and distribution components for chemical propulsion
U4	Advanced materials and material technology for combustion chambers
U5	Alternative to Hydrazine in Europe
U6	Fibre Optic Gyro (FOG) based Inertial Measurement Unit (IMU)
U7	Power amplification: Travelling Wave Tube (TWT) materials
U8	Spacecraft charging analysis tool
U9	Cost-effective high quality Ge-substrates for multi - junction solar cells
U10	Core processors for Digital Signal Processor (DSP) computers
U11	Application Specific Integrated Circuits (ASICs) for Mixed Signal Processing
U12	High capacity Field-Programmable Gate Array (FPGA)
U13	Passive components
U14	Active discrete components
U15	Photonic components
U16	Space qualified GaN components and demonstrators

U17	High density (up to 1000 pins and beyond) assemblies on PCB
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Emphasis for these activities should be on the expected medium term impact for Europe to develop or regain the capacity to operate independently in space, e.g. by developing in a timely manner reliable and affordable space technologies that in some cases may already exist outside Europe or in European terrestrial applications. Nevertheless, projects should strive to go beyond the present state of the art. Clearly identified function and performance targets have been identified for each of the above topics by the Joint EC-ESA-EDA task force¹⁸. Proposals should address how to access the commercial market with a full range (preload) of recurring products. Proposals that include development activities up to space qualification will be favoured in terms of their potential impact.

Proposals should include a work package dedicated to the development of a commercial evaluation of the technology.

- Expected impact:

The projects are expected, first and foremost, to reduce the dependence on critical technologies and capabilities from outside Europe for future space applications, as identified in the EC-ESA-EDA Critical Space Technologies for European Strategic Non-Dependence - List of Urgent Actions 2012/2013.

In addition, projects should enhance the technical capabilities and overall competitiveness of European space industry satellite vendors on the world wide market. The projects are expected to open new competition opportunities for European manufacturers by reducing the dependency on export restricted technologies that are of strategic importance to future European space efforts. They should enable the European industry to get non-restricted access to high performance technologies that will allow increasing its competitiveness and expertise in the space domain. Projects should improve the overall European space technology landscape and complement the activities of European and national space programmes.

In this context, technological spin in and/or bilateral collaborations should be enhanced between European non-space and space industries and projects are expected to provide advanced critical technologies that are of common interest to different space application domains (e.g. telecom, Earth-observation, science, etc.).

Research funding in this area should have a beneficial economic impact on SMEs in the space sector. A strong participation of SMEs in the project should help to realise this impact.

Funding schemes: *Collaborative Projects* (small or medium-scale focused research project) with upper eligibility limit of EUR 2 500 000 European Union requested contribution.

¹⁸ Critical Space Technologies for European Strategic Non-Dependence List of Urgent Actions for 2012/2013, available as part of 6th SPACE call documents to be found at <https://ec.europa.eu/research/participants/portal/page/cooperation>.

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria.

Area 9.2.3: Research into reducing the vulnerability of space assets

SPA.2013.2.3-01: Space-weather events

Solar activity modulated effects on the Sun and in the helio- and magnetosphere affect the entire Earth environment from the magnetosphere down to the ionosphere and even to the lower atmosphere climate system. Space storms (particles, plasma or electromagnetic) are a recognised aerospace hazard and can cause major failures, e.g. onboard aircraft and spacecraft, in electrical power grids, in telecommunications links (satellite, launcher and ground-based) and in navigation systems (e.g. recent peak in the solar activity have disturbed the performance of GNSS and satellite-based augmentation (SBAS) systems).

More accurate modelling and impact assessment on affected systems, in particular GNSS, of disruptive events that are to be expected as part of this cyclical phenomenon are particularly poignant.

Activities could focus on research areas such as:

- Modelling of ionospheric geographical and temporal gradients for different regions of the world (equatorial, mid-latitude and auroral regions), tracking and modelling of ionospheric disturbances such as travelling depletion, solar storms or scintillation, followed by an assessment of effects of ionosphere on navigation signals in the context of single and dual frequency usage and the definition of algorithms able to bound the maximum measurement errors caused by different ionospheric effects.
- Modelling the interaction of satellites with the space environment, especially particle flows (ranging from sub-atomic flows to micrometeoroids and small debris) placing a particular focus on the different physical processes occurring simultaneously or sequentially as a result of impacts (e.g. discharges triggered by impacts).
- Development of mitigation means.

Cooperation with international partners from third countries (ICPC), or countries which have signed an agreement with the EU covering Science and Technology, as well as other space-faring nations (e.g. US, Japan) will help to enhance research partnerships with emerging or established space powers. Therefore such international partners will be eligible to participate and to be funded and this aspect will be taken into account in the evaluation.

- Expected impact:

*Projects are expected to significantly contribute to the European capacity to improve the accuracy and reliability of the Galileo system and to **prevent damage / protect space assets** from space environment events. Projects are expected to significantly contribute to both identify **the impacts** of space environment events in particular on space-based navigation systems, including space- and ground-based infrastructures, and develop concrete solutions to mitigate these risks.*

Funding schemes: *Collaborative Projects* (small or medium-scale focused research project) with upper eligibility limit of EUR 2 000 000 European Union requested contribution.

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria.

SPA.2013.2.3-02: Security of space assets from in-orbit collisions

In recent years our reliance on space-based systems has grown to include different fields: satellite communication and earth observation are ubiquitous, as is satellite navigation. A serious threat is posed by the **alarming growth of space debris**, left from launch activities, break-ups in space and obsolete space objects.

Projects shall achieve the objective of performing an in-orbit removal of debris, in a low cost manner, using novel, realistic techniques (e.g. capture techniques like nets, grasping, tethers, harpoons, expanding foam etc... or contactless techniques like ionic beams etc...). Considering the budget allocated to this activity, cubesats, microsats and/or small satellite technology are encouraged to be used to achieve removal of a piece of space debris. Apart from the mission concept, the proposal would include how to deal with issues such as free floating approach and proximity operations, uncooperative docking and manipulation/capture challenges (e.g. tumbling objects), as well as debris capture and de-orbiting using contact and/or contactless techniques such as drag augmentation, sails, micro-propulsion, on-board tethers etc.... Dynamic modelling of the system composed by the satellite and the target debris after capture is an important issue to be considered.

The size of the space debris to be removed from the orbit could be of the size of a cubesat or larger. De-orbiting and mission completion from a low-earth orbit should take place within 1 to 2 years from mission launch.

The objective of this topic is to contribute in the long term to the debris removal of a large range of debris (from small debris to entire satellites). Therefore, debris removal techniques should be designed to be scalable for future use/development, for a range of debris targets to be assessed in the proposal, and scalability will be considered in the evaluations.

Cooperation with international partners from third countries (ICPC) , or countries which have signed an agreement with the EU covering Science and Technology, as well as other space-faring nations (e.g. US, Japan) will help to enhance research partnerships with emerging or established space powers. Therefore such international partners will be eligible to participate and to be funded and this aspect will be taken into account in the evaluation.¹⁹

- Expected impact:

The project is expected to significantly contribute to the European capacity to detect and protect space assets from space debris. Results are expected to show in real environment technologies and processes ready to be used for future space missions,

¹⁹ See also SPA-2013.3.2-01

preferably with a limited need for continued R&D support for development of technology and processes when EC funding ends. Projects should also contribute to forging new research alliances, and enhancing the relations with established international space powers is regarded to add value to European space activities.

Funding schemes: One *Collaborative Project* (small or medium-scale focused research project) with upper eligibility limit of EUR 7 000 000 European Union requested contribution.

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria.

Activity: 9.3 Cross-cutting activities

Area 9.3.1: SME specific research

SPA.2013.3.1-01: SME space technology research and technology transfer

Proposals are invited which allow SMEs to develop partnerships establishing their position in supply chains and markets with space related products and services. Newly established SMEs are particularly welcome. Projects should focus on space related research or service provision where SMEs play a central role in the value added chain. Activities can range from spacecraft technology research in various fields such as technology for in-space activities to technology for ground use of space data and to the provision of navigation or geo-information services targeting various areas like environment, agriculture, legal and financial sectors, indoor positioning etc...

Proposals should demonstrate how the projects will lead to SMEs being fully integrated into the related activity area in a sustainable manner.

Proposals should include a work package dedicated to development of a commercial evaluation of the technology/service.

- Expected impact:

Projects are expected to promote the number of SMEs involved in the development of space activities, by initiating and/or reinforcing links between SMEs (not necessarily from the space sector) and other traditional actors in the space sector. SMEs are expected to be fully integrated into the value added chain in a sustainable way through the provision of their core expertise.

The results of research in this topic should clearly be of interest and potential benefit to SMEs. A strong participation of SMEs in the project itself should help contribute to the realisation of that benefit.

The mandatory SME participation is expected to contribute to enhancing the overall SME participation in FP7, and particularly in the Theme Space.

Funding schemes: *Collaborative Projects* with an upper eligibility limit of EUR 2 000 000 requested EU contribution per project. SME²⁰ participation in these proposals is mandatory, preferably in a leading or coordinating role. More than 50% of the requested EU contribution shall go to SMEs.

Note: Limits on the EU financial contribution apply, SME participation is mandatory. Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 50% or more of the total estimated EU contribution for

²⁰ Attention is to be given to the definition of SMEs: SMEs employ fewer than 250 persons and have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million. Additional conditions for autonomy apply. More information see: http://ec.europa.eu/enterprise/enterprise_policy/sme_definition/index_en.htm

the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded. These criteria are implemented strictly as formal eligibility criteria.

Area 9.3.2: International cooperation

SPA.2013.3.2-01: Cooperation with third countries

Recent developments in dialogues on space cooperation indicate that there is a good opportunity to benefit from **cooperation with the Ukraine**.

In the framework of the Joint working group on EU-Ukraine space cooperation, several activities for development have been identified. R&D proposals are invited which address one of the following three subject areas:

- GMES services for agricultural needs;
- Super light-weight materials and coating technologies for space-based systems;
- Methodologies and technologies for active removal of space debris and/or mitigation of space debris effects.²¹

Participation of one (or more) Ukrainian participant(s) is mandatory for this set of proposed activities. It is expected that proposals provide the opportunity for R&D to the mutual benefit of EU and Ukrainian participants, with a balanced distribution of efforts between the EU and Ukrainian partners.

A further domain of interest for international cooperation is the validation and further refinement of monitoring methods of air-quality globally and at regional levels. In the framework of **cooperation with China**, proposals are invited which address the improvement of monitoring methods of air-quality (combining space and in-situ data), validation, elaboration of indicators and development of a remote-sensing toolbox for air-quality and emissions monitoring. Participation of one (or more) Chinese participant(s) is mandatory for this proposed activity.

- Expected impact:

Projects are also expected to positively impact the international collaboration in this field beyond the timeframe of EC support.

Funding schemes: *Collaborative Projects* with an upper eligibility limit of EUR 2 000 000 requested EU contribution per project.

Area 9.3.3: Dissemination: Transnational and international cooperation among NCPs

²¹ Projects on space debris can either be presented under this heading or under heading SPA.2013.2.3-02.

This part will **not be open** for specific call topics in 2013.

Area 9.3.5: Studies and events in support of European Space Policy

This part will **not be open** for specific call topics in 2013.

III. IMPLEMENTATION OF CALLS

For description of the topics of the calls, please refer to section II 'Content of calls'

- **Call title: Space Call 6**

- Call identifier: **FP7-SPACE-2013-1**
- Date of publication²²: 10 July 2012
- Deadline²³: 21 November 2012, at 17.00.00, Brussels local time
- Indicative budget²⁴: EUR 126 million

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

- **Topics called:**

Activity/ Area	Topics called	Funding Schemes
9.1.1 Space-based applications at the service of European Society / Pre-operational validation of GMES services and products	SPA.2013.1.1-01: Global 20th century re-analysis and coupling methods	Collaborative Project (Small or medium-scale focused research project)
	SPA.2013.1.1-02: Ensemble system of regional re-analyses	Collaborative Project (Small or medium-scale focused research project)
	SPA.2013.1.1-03: Traceable quality assurance system for multi-decadal ECVs	Collaborative Project (Small or medium-scale focused research project)
	SPA.2013.1.1-04: Provision of access to simulated and observed climate datasets and climate indicator toolbox	Collaborative Project (Small or medium-scale focused research project)

²² The Director-general responsible for the call may publish it up to one month prior to or after the envisaged date of publication

²³ The Director-general responsible may delay this deadline by up to two months

²⁴ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

	SPA.2013.1.1-05: Attribution products	Collaborative Project (Small or medium-scale focused research project)
	SPA.2013.1.1-06: Stimulating development of downstream services and service evolution	Collaborative Projects (Small or medium-scale focused research project)
	SPA.2013.1.1-07: Remote sensing methods	Collaborative Projects (Small or medium-scale focused research project)
9.1.2 Space-based applications at the service of European Society / Integration of satellite communication and satellite navigation solutions with space-based observing systems	SPA.2013.1.2-01: Integrated downstream service activities and applications	Collaborative Projects (Small or medium-scale focused research project)
9.2.1 Strengthening the foundations of Space science and technology / Research to support space science and exploration	SPA.2013.2.1-01: Exploitation of space science and exploration data	Collaborative Projects (Small or medium-scale focused research project)
	SPA.2013.2.1-02: Earth-analogue research preparing for space exploration	Collaborative Projects (Small or medium-scale focused research project)
9.2.2 Strengthening of Space foundations / Research to support space transportation and key technologies	SPA.2013.2.2-01: Space critical technologies	Collaborative Projects (Small or medium-scale focused research project)
9.2.3 Strengthening of Space foundations / Research into reducing the vulnerability of space assets	SPA.2013.2.3-01: Space-weather events	Collaborative Projects (Small or medium-scale focused research project)
	SPA.2013.2.3-02: Security of space assets from in-orbit collisions	Collaborative Project (Small or medium-scale focused research project)
9.3.1 Cross-cutting activities / SME specific research	SPA.2013.3.1-01: SME space technology research and technology transfer	Collaborative Projects (Small or medium-scale focused research project)
9.3.2 Cross-cutting activities /	SPA.2013.3.2-01: Cooperation with third countries	Collaborative Projects (Small or medium-scale

International cooperation		focused research project)
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• **Eligibility criteria:**

- The general eligibility criteria for the different funding schemes are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Funding scheme	Minimum conditions
Collaborative Projects	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (supporting action)	At least 1 independent legal entity established in a MS or AC.

The following additional eligibility criteria and funding constraints apply in this call

- For Activity 9.1, Topic 1.1-01, the maximum eligible EU contribution is EUR 7 000 000 per project, proposals requesting in excess will be ineligible. Only CP are requested.
- For Activity 9.1, Topic 1.1-02, the maximum eligible EU contribution is EUR 5 000 000 per project, proposals requesting in excess will be ineligible. Only CP are requested.
- For Activity 9.1, Topic 1.1-03, the maximum eligible EU contribution is EUR 5 000 000 per project, proposals requesting in excess will be ineligible. Only CP are requested.
- For Activity 9.1, Topic 1.1-04, the maximum eligible EU contribution is EUR 6 000 000 per project, proposals requesting in excess will be ineligible. Only CP are requested.
- For Activity 9.1, Topic 1.1-05, the maximum eligible EU contribution is EUR 3 000 000 per project, proposals requesting in excess will be ineligible. Only CP are requested.
- For Activity 9.1, Topic 1.1-06, the maximum eligible EU contribution is EUR 2 500 000 per project, proposals requesting in excess will be ineligible. Only CP are requested.
- For Activity 9.1, Topic 1.1-07, the maximum eligible EU contribution is EUR 2 000 000 per project, proposals requesting in excess will be ineligible. Only CP are requested.
- For Activity 9.1, Topic 1.2-01, the maximum eligible EU contribution is EUR 2 500 000 per project, proposals requesting in excess will be ineligible. Only CP are requested.

- For Activity 9.2, Topic 2.1-01, the maximum eligible EU contribution is EUR 2 500 000 per project, proposals requesting in excess will be ineligible. Only CP are requested.
- For Activity 9.2, Topic 2.1-02, the maximum eligible EU contribution is EUR 2 500 000 per project, proposals requesting in excess will be ineligible. Only CP are requested.
- For Activity 9.2, Topic 2.2-01, the maximum eligible EU contribution is EUR 2 500 000 per project, proposals requesting in excess will be ineligible. Only CP are requested.
- For Activity 9.2, Topic 2.3-01, the maximum eligible EU contribution is EUR 2 000 000 per project, proposals requesting in excess will be ineligible. Only CP are requested.
- For Activity 9.2, Topic 2.3-02, the maximum eligible EU contribution is EUR 7 000 000 per project, proposals requesting in excess will be ineligible. Only CP are requested.
- For Activity 9.3, Topic 3.1-01, the maximum eligible EU contribution is EUR 2 000 000 per project, proposals requesting in excess will be ineligible. These SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 50% or more of the total estimated EU contribution for the project as a whole. **This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.** Only CP are requested.
- For Activity 9.3, Topic 3.2.01, the maximum eligible EU contribution is EUR 2 000 000 per project, proposals requesting in excess will be ineligible. Only CP are requested. Participation from the respective international partner mentioned in the topic is mandatory.
- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Evaluation procedure:**

- The standard procedures set out in the FP7 Rules for submission of proposals, and the related evaluation, selection and award procedures, will apply.
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.

The Commission will instruct the experts to disregard any pages exceeding these limits.

The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).

- The evaluation criteria (including weights and thresholds) and sub-criteria, together with the selection and award criteria for the different funding schemes are set out in Annex 2 to this work programme.
- For proposals submitted for Activity 9.3, Topic 3.1.01 the following additional aspects will be considered under the evaluation criterion relating to 'implementation':

- Proposals are expected to have a substantial involvement of SMEs. As an indication of the expected level of involvement, evaluators should note that only proposals where at least 50% of the estimated EU contribution goes to SMEs will be eventually selected. This will be checked at the end of any negotiation. As regards a leading role of SMEs with R&D capacities: the coordinator does not necessarily have to be an SME for the project to qualify, but in such cases the participating SMEs should have the decision making power in the project management, and the output should be for the benefit of the participating SMEs and the targeted SME-dominated industrial communities.
- A one-stage submission procedure will be followed.
- Proposals may be evaluated remotely.
- For Activity 9.2, four ranking lists will be established; one for each of the topics (SPA.2013.2.1-01&02, SPA.2013.2.2-01, SPA.2013.2.3-01 and SPA.2013.2.3-02)
- During final ranking, the procedure for prioritising proposals with equal scores described in Annex 2 to the work programme will be modified as follows for the proposals in GMES area 9.1 only:
 - “The following approach will be applied successively for every group of ex-aequo proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:
 - (i) Proposals, that address topics not otherwise covered by more highly-rated proposals, will be considered to have the highest priority.
 - (ii) These proposals will themselves be prioritised according to the scores they have been awarded for the criterion **impact**. When these scores are equal, priority will be based on scores for the criterion **scientific and/or technological excellence**. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme (e.g. presence of SMEs, international co-operation, public engagement).
 - (iii) The method described in (ii) will then be applied to the remaining ex-aequos in the group.”.

- **Indicative evaluation and contractual timetable:**

This call in 2012 invites proposals to be funded in 2013. The evaluation is to commence within 2 months of the call deadline, with negotiations of successful proposals commensurate with the 2013 budget expected to commence in the first half of 2013.

Proposals recommended for funding, which cannot be financed from the available budget will be put in a reserve list after evaluation, to allow for later funding in case of availability of additional budget or failure to complete negotiation of a proposal recommended for funding.

In order to reduce the time to signature of the grant agreement, participants are requested to also ready themselves for the negotiation phase. Attention should be given to eligibility of the costs expected to be covered, and to provide in the proposal appropriate justification of use of resources including a breakdown of the personnel and other direct costs

per participant. Detailed information should be provided on eventual subcontracting and third parties intended to be included. Furthermore, attention should be paid to correctly define work packages and activities according to the different type of activities: RTD; DEM; MGT²⁵; OTHER; COORD or SUPP.

A rapid response of the coordinator in supplying the necessary negotiation documentation will be expected if the proposal is recommended for negotiation.

Details on above indicated issues are included in the Guide for Applicants.

- **Implementation**

Calls for proposals under this work programme Space will be implemented by the Research Executive Agency (REA) according to the provisions of the Commission Decision C(2008)3980 final of 31 July 2008 “delegating powers to the Research Executive Agency with a view to performance of tasks linked to implementation of specific European Union programmes People, Capacities and Cooperation in the field of research comprising, in particular, implementation appropriations entered in the Community budget”.

All activities under 9.1 to 9.3 are included in this delegation, only public procurement actions are excluded from this delegation and will be managed by the Commission.

- **Consortia agreements**

The conclusion of a Consortium Agreement is required for any action under the Space Theme.

- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Third country partners:**

In accordance with Article 29.2(a) of the Rules for Participation²⁶, for Activity 9.2, topics.2.1-01, 2.1-02, 2.3-01 and 2.3-02, legal entities established in a third country other than an associated country or international cooperation partner country are eligible for funding.

- **Flat rates to cover subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions as outlined in Commission decision C(2009)1942 of 23 March 2009. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: https://ec.europa.eu/research/participants/portal/page/fp7_documents under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

²⁵ Management activities cover the management of financial, legal and administrative issues but not scientific coordination of the project

²⁶ REGULATION (EC) No 1906/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013)

IV. OTHER ACTIONS

The following activities will be supported through funding by the Space theme in 2013, but **will not be subject of a call**²⁷ under the Space theme:

- 1) Development of GMES-dedicated space infrastructure
- 2) Support to GMES Initial Operations
- 3) Communication and Conferences
- 4) Monitoring, Evaluation, Studies and Impact Assessment
- 5) Risk-sharing Finance Facility (RSFF).

These activities are supplementary to the activities undertaken as a result of the calls for proposals in the FP7 Space theme. Applicants are invited to take benefit of these as appropriate in their proposals (for instance make use of access to the coordinated provision of observation data for GMES, or include the possibility of EIB loans to fulfil the Commission's co-financing requirements).

Development of GMES-dedicated space infrastructure

As stated in the GMES Communication of 2005, FP7 funding is foreseen to provide a significant part to the *GMES Space Component* (GSC) Programme of ESA, in particular regarding the development of GMES-dedicated space-based infrastructure.

Overall, about 47% of the FP7 'Space' budget²⁸ could be made available for this action over the period 2007-2013. Based on the specific capacities provided by ESA in this domain, the Commission has decided to **delegate to ESA the management**²⁹ of the implementation of the FP7 funding of the GMES Space Component (GSC) Programme of ESA.

The respective annual financial contributions to be provided from FP7 shall be foreseen in the annual updating cycle of the work programme, taking account of any update or revision of the GSC. For 2013, a contribution of EUR 180 million is foreseen³⁰.

Financial support from FP7 should contribute to the activities proposed by ESA in the GMES Space Component Programme.

²⁷ In accordance with Articles 14, 17 and 27 of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

²⁸ Including the corresponding share of support to the horizontal support to cross-cutting activities, as well as of the relevant administrative expenses.

²⁹ Commission Decision C(2008)563 of 8 February 2008

³⁰ Subject to the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

EU funding to ESA will be contingent upon the effective implementation of the GSC programme in the ESA framework and compliance with the administrative and financial regulations applicable to the general budget of the European Union³¹ and with the EC/ESA Framework Agreement³².

With a view to ensuring the efficient and coherent monitoring and evaluation of the implementation of actions carried out by ESA on behalf of the Commission under FP7, an adequate monitoring and control process is put in place. It is in fact assumed that the GSC Programme continues to be developed by ESA in a way that is demonstrably coherent with the emerging user requirements being aggregated by the Commission. ESA shall also regularly inform the Commission of the overall progress of the implementation of the Specific Programme, as well as on the specific results of procurement actions, and shall provide timely information on allocations proposed or funded under this programme.

The issues of security of space infrastructure (e.g. in terms of encryption of data transmission, where necessary) and optimised data relay solutions (e.g. inter-satellite and satellite-to-ground transmission technologies) should also be examined in this context.

It is essential that best use of existing and planned European satellites and ground systems is being made – including those existing in other European agencies and organisations such as EUMETSAT – in order to efficiently ensure the continuity of data necessary to the establishment of GMES services on an operational basis - to the development of which this work programme is aimed.

In addition to the GSC technical activities covering development of dedicated satellites, ground segment and data access, a number of additional accompanying activities will also be undertaken by ESA, notably to achieve a significant participation of the non-ESA Member States in FP7, stimulating the active involvement of their industries and research organisations, improving visibility, accessibility and understanding of the tender selection procedures of ESA in line with the EU Financial Regulations and FP7 context. For these activities a variety of funding schemes in line with the EU Financial Regulation may be used. Further information on opportunities is available on Space Theme CORDIS website (http://cordis.europa.eu/fp7/cooperation/space_en.html).

Funding scheme: other actions³³ - Delegation Agreement to ESA

³¹ Council Regulation (EC,Euratom) No 1605/2002 of 25 June 2002 and Commission Regulation (EC,Euratom) No 2342/2002 of 23 December 2002

³² COM(2004)0085, 11 February 2004. The EC/ESA Framework Agreement specifies, inter alia (Art.5.3) that: *“Any financial contribution made by one Party in accordance with a specific arrangement shall be governed by the financial provisions applicable to that Party. Under no circumstances shall the European Community be bound to apply the rule of “geographical distribution” contained in the ESA Convention and specially in Annex V thereto.”*

³³ In accordance with Article 53(d) of the Financial Regulation and Articles 35 and 43 of the Implementing Rules.

Support to GMES Initial Operations

Regulation (EU) No 911/2010 of the European Parliament and of the Council of 22 September 2010 on the European Earth monitoring programme (GMES) and its initial operations (2011 to 2013) makes funding allowances for a number of operational objectives, however, support of the research and development funding under FP7 will also be required, and a dedicated support from FP7 by an amount of EUR 43 million over the three year period is foreseen. For the budget year of 2011 and 2012, respective amounts of EUR 10 million and EUR 15 million were set aside for this support and EUR 18 million are being earmarked for the budget year 2013³⁴.

GMES Initial Operations (GIO) have according to the Regulation the following 5 operational objectives:

- (1) emergency response services, based on existing activities in Europe, shall ensure that Earth observation data and derived products are made available for the benefit of emergency response players;
- (2) land monitoring services shall ensure that Earth observation data and derived products are made available for the benefit of European, national and regional authorities;
- (3) measures to support take-up of services by users;
- (4) data access, including support to in situ data collection;
- (5) GMES initial operations shall ensure the operations of the GMES space component.

The 2013 Work programme will provide funding for GMES Data Access activities which are supporting these operational objectives and benefit the research community at large. The main objective of such GMES Data Access activities is to provide access to Earth observation data from all GMES Contributing Missions required by the user communities, such as the GMES Services, from the 4th quarter of 2010 until end 2013, and until the end of the commissioning phase of Sentinel-1A, -2A, and 3A:

- as a smooth continuation of the data supply started under the GMES Space Component Data Access EC FP7 grant no FP7-223001 (GSC-DA)
- with a smooth continuation towards the GIO and full operations phase later.

The detailed description of the way ESA will perform these GMES Data Access activities for the period of 4th quarter of 2010 until end 2013 is described in a Project Implementation Plan complementing the EC-ESA Delegation Agreement. These activities will be based on technical requirements defined by the EC, aiming at serving with EO data the GMES services both identified in GIO supported through the FP7 programme, and the community implementing GMES at large, and which were elaborated following a user Hearing on Access to GMES Earth Observation Data on 17 December 2009.

Funding scheme: other actions³⁵ - Delegation Agreement to ESA

³⁴ Subject to the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

³⁵ In accordance with Article 53(d) of the Financial Regulation and Articles 35 and 43 of the Implementing Rules.

Communication and Conferences

Public events promoting the uptake of activities undertaken within the context of the FP7 Space, as well as fostering the implementation of the European Space Policy and the European Space Programme will also be funded from the FP7 2013 budget.

Support will be given to the organisation of events (conferences, workshops or seminars) related to the implementation of the European Space Policy, European R&D research agendas related to GMES and space technologies, and European space research, development and innovation after 2013. Special attention will be given to events which aim to explore and implement specific initiatives in the field of space for innovation, and the question of how space exploration could contribute to innovation as well as events related to space exploration. These events should support the political debate and consensus building in Europe.

During 2013, it is envisaged to conduct communication actions (such dissemination material) and large events in support of the implementation of the European Space Policy in general, and GMES and European Space Exploration in particular. Support may be given to the organisation of conferences and information events to strengthen wider participation in the programme (including that of third countries), and to disseminate results of European research in the Space sector. It is intended to rely on framework contracts already in place to obtain communication and conference support.

The overall commitment appropriations for this public procurement activity (by using framework contracts and/or calls for tender) will be up to EUR 500 000³⁶.

Funding scheme: Coordination and Support Action (CSA) – public procurement

Monitoring, Framework Programme Evaluation, Studies and Impact Assessment

The Space Theme will comply with the prevailing requirements for monitoring and evaluating the Framework Programme and its impact, both ex-ante and ex-post. In preparation of the period after 2013, activities will be conducted to prepare the implementation of the European Space Programme.

This may involve studies and surveys as appropriate implemented through public procurement, and/or appointing (groups of) independent experts. It is intended to rely on framework contracts already in place to obtain study support. Implementation through existing framework contracts is preferred in order to further ensure that the Commission is provided with timely analyses, which in turn will facilitate the proper integration of policy studies into the preparation of new policy initiatives.

This activity foresees in particular a specific study investigating the appropriateness of and the modalities for a second procurement source of on-board Galileo clocks.

The overall commitment appropriations for this Activity in 2013 will be up to EUR 500 000³⁷.

³⁶ Subject to the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

Funding scheme: Coordination and Support Action (CSA) – expert contracts and/or public procurement

Risk-sharing Finance Facility

The preparation of operational service capacities, as well as development of the GMES space components correspond to large undertakings and projects, involving long-term investments, with considerable risks for participating industries. Promoters need access to additional cash-flow to fulfil the Commission's co-financing requirements, enabling them to finance more (and more risky) projects. It is for such R&D actions that the European Union will improve the access to private sector finance by contributing financially to the 'Risk-Sharing Finance Facility' (RSFF) established by the European Investment Bank (EIB). The Space theme is contributing to this funding facility, from its budget, and participants are invited to make use of this FP7 supporting scheme.

Further information on the RSFF is given in the Annex 4 to this work programme.

³⁷ Subject to the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

V. BUDGET

Theme Space - Indicative budget

A total of EUR 329.6 million is to be committed from the 2013 European Union budget³⁸. The indicative budget allocated to the activities from the 2013 budget is given in the following table:

Activities	2013³⁹ Budget EUR million⁴⁰	
Call FP7-SPACE-2013-1		
<u>Activity 9.1</u> Space-based applications at the service of European Society :		
1.1 Global 20th century re-analysis and future coupling methods	7	59
1.2 Ensemble system of regional re-analyses	5	
1.3 Traceable quality assurance system for ECVs	5	
1.4 Provision of access to simulated and observed climate datasets and climate indicator toolbox	6	
1.5 Attribution products	3	
1.6 Stimulating development of downstream services and service evolution	20	
1.7 Remote sensing methods	8	
Call FP7-SPACE-2013-1		
<u>Activity 9.1</u> Space-based applications at the service of European Society :		
2.1 Integrated downstream service activities and applications	5	
Call FP7-SPACE-2013-1		51
<u>Activity 9.2</u> Strengthening of Space foundations:		
1.1 Exploitation of space science and exploration data	20	
1.2 Earth-analogue research preparing for space exploration		
Call FP7-SPACE-2013-1		
<u>Activity 9.2</u> Strengthening of Space foundations:		
2.1 Space critical technologies	20	

³⁸ Subject to the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

³⁹ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority.

⁴⁰ The Budget figures are rounded to two decimal points

Call FP7-SPACE-2013-1		
<u>Activity 9.2</u> Strengthening of Space foundations:		
3.1 Space-weather events	4	
3.2 Security of space assets from in-orbit collisions – mission concepts	7	
Call FP7-SPACE-2013-1		
<u>Activity 9.3</u> Cross- cutting activities		
1.1 SME space technology research and technology transfer	10	16
Call FP7-SPACE-2013-1		
<u>Activity 9.3</u> Cross- cutting activities		
2.1 Cooperation with third countries	6	
ACTIVITIES NOT SUBJECT TO A CALL FOR PROPOSALS:		
1 ESA Delegation Agreement (re. 9.1)	180	199
2 Space Data Access (via ESA Delegation Agreement)	18	
3 Communication and Conferences, Monitoring, Programme Evaluation, Studies and Impact assessment	1	
OTHER ACTIVITIES		
1 FP7 Expert proposal evaluators payments (review, evaluation)	2	2
GENERAL ACTIVITIES (CF. ANNEX 4)	2.62	2.62
ESTIMATED TOTAL BUDGET ALLOCATION		329.62

General activities - Indicative budget

Activities	2013⁴¹ Budget EUR million
Cordis	0.411
Eureka/Research Organisations	0.021
COST	2.185
Experts	0.005
Total	2.622

All budgetary figures given in this work programme are indicative. The final budgets may vary following the evaluation of proposals.

The final budget awarded to actions implemented through calls for proposals may vary:

- The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

For actions not implemented through calls for proposals:

- The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions;
- The final budget awarded for all other actions not implemented through calls for proposals may vary by up to 10% of the indicated budget for these actions.

⁴¹ Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority.

WORK PROGRAMME 2013

COOPERATION

THEME 10

SECURITY

(European Commission C (2012)4536 of 09 July 2012)

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Objective:

The objective of the Security theme is to develop the technologies and knowledge for building capabilities needed to ensure the security of citizens from threats such as terrorism, natural disasters and crime, while respecting fundamental human rights including privacy; to ensure optimal and concerted use of available and evolving technologies to the benefit of civil European security, to stimulate the cooperation of providers and users for civil security solutions, improving the competitiveness of the European security industry and delivering mission-oriented research results to reduce security gaps.

I. CONTEXT

A secure Europe is the basis for planning our lives, for economic investments, for prosperity and freedom. The Security theme contributes to the implementation of EU external policies¹, to the creation of an EU-wide area of freedom, justice and security², in the context of the “Stockholm Programme”, and to policy areas such as transport³, health⁴, civil protection⁵, energy,⁶ development⁷ and environment⁸.

Through this, the Security theme also contributes to the *Europe 2020* strategy⁹ and its *Innovation Union* flagship initiative¹⁰, by promoting growth and employment in general, stimulating innovation (including in Small and Medium Enterprises), enhancing the competitiveness of European industry, closing the gap between research and market, ensuring a better involvement of SMEs, and responding more rapidly to current needs and enhancing international cooperation.

The Innovation Union initiative underlines that research and innovation are key drivers of competitiveness, jobs, sustainable growth and social progress. The work programme 2013 has been designed to support the implementation of the Innovation Union Initiative and in particular to bring together research and innovation to address major challenges.

This work programme contributes to the innovation objective in particular by supporting more topics aimed at generating knowledge in support of delivering new and more innovative products, processes and services. For this reason the possibility of submitting proposals that include significant testing, validation and demonstration activities in response to all topics (i.e. not only within the already existing “demonstration programmes”) has been included, as well as two topics on pre-operational validation.

This work programme also contributes to the Innovation Union by identifying and addressing exploitation issues, like capabilities for innovation and dissemination, and by enhancing the

¹ http://www.eeas.europa.eu/index_en.htm

² http://ec.europa.eu/dgs/home-affairs/index_en.htm

³ http://ec.europa.eu/transport/index_en.htm

⁴ http://ec.europa.eu/health/index_en.htmv

⁵ http://ec.europa.eu/echo/civil_protection/civil/index.htm

⁶ http://ec.europa.eu/dgs/energy/index_en.htm

⁷ <http://europa.eu/pol/dev/>

⁸ http://ec.europa.eu/dgs/environment/index_en.htm and http://ec.europa.eu/clima/news/index_en.htm

⁹ COM (2010) 2020

¹⁰ COM (2010) 546

use of the generated knowledge (protection of intellectual property rights like patenting, preparing standards, etc).

Information on the Risk-Sharing Finance Facility (RSFF), an innovative financial instrument under FP7, is available online¹¹. The Commission will respond to further needs of potential beneficiaries for information on the RSFF (by, e.g., awareness-raising activities in conjunction with the European Investment Bank, participation to thematic events).

The respect of privacy and civil liberties is a guiding principle throughout the theme. All individual projects must meet the requirements of fundamental rights, including the protection of personal data, and comply with EU law in that regard.

The Security theme focuses exclusively on civil application.

The Security theme facilitates the co-operation and coordination of various national and international actors in order to avoid unnecessary duplication and to explore synergies wherever possible. Furthermore, the Commission will ensure full complementarity with other EU initiatives and avoid duplication, e.g. with the 'Framework Programme on Security and Safeguarding Liberties' (SSL), which focuses on actions related to policy and operational work in the area of law enforcement and combating and preventing crime/terrorism, while the Security theme supports R&D actions oriented towards new methodologies and technologies.

Following the September 2006 recommendations of the Commission's *European Security Research Advisory Board (ESRAB)*¹², the Security theme addresses four security mission areas of high political relevance. It contributes to building up the **capabilities** necessary for safeguarding security in these mission areas by funding the research that will produce **technologies and knowledge** to build up these capabilities.

It is clear moreover, that the use of security related technologies must always be embedded in political action. To support this and also to improve the effectiveness and efficiency of the technology related research, three areas of cross-cutting interest are selected as well.

The overall structure of the Security theme, including the seven activity areas, is summarised in the following table:

Security mission areas:

1. Security of citizens
2. Security of infrastructures and utilities
3. Intelligent surveillance and border security
4. Restoring security and safety in case of crisis

Cross-cutting areas:

5. Security systems integration, interconnectivity and interoperability
6. Security and society
7. Security Research coordination and structuring

In September 2007, the *European Security Research and Innovation Forum (ESRIF)* was established with 64 high level members, including two representatives of the European

¹¹ <http://www.eib.org/products/loans/special/rsff/?lang=en>

¹² *ESRAB Report: Meeting the Challenge: the European Security Research Agenda - A report from the European Security Research Advisory Board, September 2006. ISBN 92-79-01709-8.*

Commission, and over 600 experts. The objective of ESRIF was to develop a mid and long term Joint Security Research Agenda that will link security research with security policy making and its implementation. The ESRIF Final Report¹³ was published in December 2009. In its communication the Commission welcomed the ESRIF Report¹⁴ and acknowledged its importance in the context of the FP7 Security theme.

The Security theme aims at **meeting its main objectives – improved security for the citizens, and enhanced competitiveness for industry.** Successful demonstration of the appropriateness and performance of novel solutions are key requirements for exploiting the output of the research work and its implementation by security policies and measures. The Security theme should also support the (re)structuring of the European security sector.

Research in the Security theme consists of several building blocks, representing three - in some cases parallel, in others subsequent - routes that contribute to the overall objectives (see figure 1):

- On the lowest level of the building block structure, ‘**Capability Projects**’ (CPs) aim at building up and/or strengthening security capabilities. This will be done through *adaptation of available technology* in its appropriate societal context as well as the development of *security specific technology and knowledge aiming at tangible results*. In many cases these will also have cross-mission relevance.
Typical duration: 2-4 years
Funding scheme: *Collaborative Projects*

- On the medium level of the building block structure, ‘**Integration Projects**’ (IPs) aim at mission specific combination of individual capabilities providing a security *system* and demonstrating its performance.
Typical duration: 3-4 years
Funding scheme: *Collaborative Projects*

- On the top level of the building block structure, ‘**Demonstration Programmes**’ (DPs) will carry out research aiming at large scale integration, validation and demonstration of new security systems of systems going significantly beyond the state of the art. They depend upon the compatible, complementary and interoperable development of requisite system and technology building blocks of the integration projects and capability projects. They intend to promote the application of an innovative security solution, which implies a strong involvement of end-users, taking into account the relevant legal and society related issues, and strong links to new standardisation. ESRAB identified five

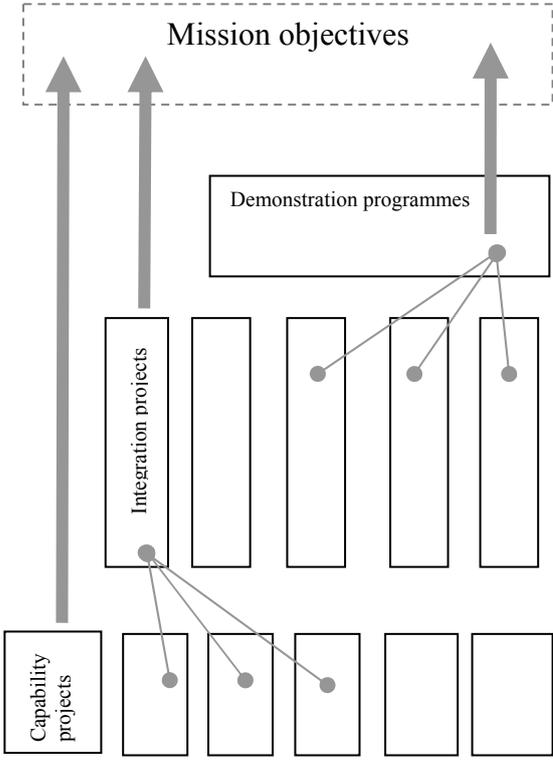


Figure 1: Research routes to meet the Security theme objectives

¹³ See www.esrif.eu
¹⁴ COM(2009)691

topic areas for Demonstration programmes: 1) Aftermath crisis management, 2) Border control, 3) Logistic and supply chain security, 4) Security of mass transportation and 5) CBRNE. Demonstration programmes will be implemented in two phases:

Phase I projects (either one or several projects in each of the demonstration programmes) will define the strategic roadmaps and trigger Europe wide awareness, both elements involving strategic public and private end-users as well as industry and research. The strategic roadmaps will take into account relevant completed, ongoing and planned work and indicate further research needs for Security theme integration projects and capability projects, but also for other themes of the Seventh Framework Programme or for the national level.

Typical duration: 1 year

Funding scheme: *Coordination and Support Actions*

Phase II projects (either one or several projects in each of the demonstration programmes) will then technically implement the system of systems demonstration, taking already into account steps which have to follow the research, like certification and/or standardisation (if and as appropriate), development of marketable products and pre-procurement. This will mobilise a significant volume of resources.

Typical duration: 3- 4 years

Funding scheme: *Collaborative Projects*

- **Pre Operational Validation (POV):** the POV differs from and complements the other project types such as CPs, IPs, DPs , by involving directly – and supporting financially – end-user agencies (typically national or European authorities). This would shorten time to market and encourage market acceptance of new technologies when seen as part of a coordinated policy framework, including: standardisation, certification and regulation of innovative goods and services (and eventually facilitating coordination of procurement policies). POV could be done either via a decentralised network (of national agencies / public bodies) or via a single EU Agency or a combination of both. The basic idea of a POV scheme is to support the *demand* side of research, rather than the *supply* side, in their direct quest for new security solutions.

Funding would be in general for one (or both) of two purposes:

(i) the *coordination* of relevant institutions or authorities (as appropriate), acting as specifiers and *certifiers* of new technologies (100% support); and

(ii) the actual *implementation* of the corresponding calls for tenders (50% support¹⁵), for testing/validation of novel security solutions (implemented according to the own criteria and specifications of the participating institutions or authorities).

Typical duration: 3- 4 years

Funding scheme: a combination of *Coordination and Support Actions* (for coordination of validation policies) and *Collaborative Projects* (for implementation of testing and validation). In the case of collaborative projects more than 75% of the EU contribution should be aimed at developing and testing technologies.

For the **cross-cutting domains** of the Security theme, actions can be both self-standing or linked to the missions in activities 1 to 4. Society-relevant issues will also be integrated into technology projects.

¹⁵ In case of "Market Failure", funding of up to 75% of the related research activities can be envisaged, in analogy with the equivalent rule in Capability Projects.

Funding schemes

In the general context of FP7 model grant agreements, the following funding schemes are envisaged:

- **Collaborative Projects** in this work programme are divided into
 - a) small or medium-scale focused research project (CP-FP), and
 - b) large scale integrating project (CP-IP).

Demonstration Projects (Phase II) and Integration Projects described above will be implemented using the funding scheme Collaborative Project (large scale integrating project) with an indicative EU requested funding of over EUR 3 500 000.

Capability projects will be implemented using the funding scheme Collaborative Project (small or medium-scale focused research project) with an indicative requested funding of EUR 3 500 000.

Within the above indicative funding levels, proposals should strive to be **as small and simple as possible** (e.g. avoiding unduly large and complex consortia) **and as large as necessary**. In other words, the size of projects – and of consortia – should be the result of, and justified by, the intended project objectives, and not the other way round!

- **Coordination and Support Actions (CSA)** are divided in **Coordinating Actions** and **Supporting Actions**. Core activities will be studies, networking, exchanges of personnel, exchange and dissemination of good practices, the definition and organisation of joint or common initiatives, meetings, conferences and events etc. and the management of the action.

75% funding for research activities

In the Security theme (and *only* in this theme), the EU funding for research activities may reach a **maximum of 75%** in cases with very **limited market size** and a **risk of ‘market failure’**, and for **accelerated equipment development** in response to new threats.¹⁶ To claim this higher funding level, proposers need to demonstrate in their proposal that the required conditions apply. Please note that this higher funding level applies *only* to research activities, whereas demonstration activities are excluded from these provisions. Please note that these special provisions should not be confused with the 75% funding rate that is anyway available to SMEs all throughout FP7, independent of market conditions.

The forms of model grant agreements to be used for the funding schemes for the Security theme are outlined in Annex 3.

SME relevant research

All actions are open to the participation of all security stakeholders: industry, including Small and Medium Enterprises (SMEs), research organisations, universities, as well as public

¹⁶ Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013) Art 33.1

authorities, non-governmental organisations and public and private organisations in the security domain. Considering the Security theme's objective of increasing the competitiveness of industry, the broad **involvement of SMEs** in consortia is highly encouraged. The topics concerned by this specific action are explicitly mentioned in the description of the topics.

Moreover, in order to further promote the participation of SMEs in the Security theme, **two open topics for SMEs** have been included in part II of this work programme.

International Cooperation¹⁷

All actions of the Security theme are open to **international co-operation** to high income countries as well as to ICPC¹⁸ countries. The proposal should clearly explain how far the contribution of the international partner(s) is essential in order to allow a better assessment of their potential co-funding. As a specific action, the topic 2.4-1 is earmarked for an enhanced international cooperation, through a *recommended* participation of International Cooperation (INCO) partners, following current discussions and workshops with relevant international research partners, and in particular with US homeland security research entities. For this specific action (topic 2.4-1) an EU financial contribution is foreseen.

Dissemination actions

In general, particular networks of security research stakeholders (including both the supply and the demand side) are seen as instrumental in promoting the **dissemination** of security research to its end-users, national public authorities and citizens alike. Attention is drawn to the exploitation strategy requirements, which is part of the evaluation criterion 3, Impact. Suitable and dedicated coordination and support actions to achieve this could also receive funding. It is important to strengthen these activities in all projects.

Further theme specific information

In order to ensure that the outcome of the research carried out under the Security theme does in particular contribute to meeting the theme's main objective - the improvement of the security of the citizens - co-operation between the user side (authorities and organisations responsible for the security of the citizens) and the supply side of security technologies and solutions must be promoted. Thus the active **involvement of end-users** in the projects is considered of utmost importance. Whenever possible, this should translate into a direct participation of user organisations to the consortia implementing research actions (though other forms of indirect participation might also be followed, as appropriate).

Security theme actions should generally be **multidisciplinary** and **mission-oriented**. A multi-purpose nature of technologies is encouraged to maximise the scope for their application, and to foster cross-fertilisation and the actual take-up of **critical technologies** for the civil security sector.

The **testing, validation** and **demonstration** of the security solutions developed in the projects, involving as much as possible the end-users, is considered at the core of the Security theme. These activities should be present in every type of project (as appropriate): *Demonstration Programmes* but also *Integration Projects* or *Capability Projects*. **Concrete**

¹⁷ http://cordis.europa.eu/fp7/ict/international/st-agreements_en.html

¹⁸ ICPC: *International Co-operation Partner Countries* - see Annex 1.

achievements and milestones are strongly encouraged, in particular in terms of expected impact.

Proposers are also encouraged to take into account **the pre-normative research dimension** in the Security theme. Research projects should focus, when possible, on the analysis and development of standards in the context of their research, thus supporting the creation of EU wide standards for security technologies.

Standards are considered crucial for interoperability and take-up of research results. Preparation and promotion of standards within the projects is encouraged. Self-standing actions related to **interoperability and standardisation** are open in the Security call 6.

Attention must be given to the **societal impact**¹⁹ of the proposed security solutions. Awareness of the project's contribution to the security of European citizens and respect for fundamental rights and compliance with European societal values, including privacy issues, need to be embedded in each proposal and foreseen in the proposal's work plan. Proposals should consider possible side effects of technological solutions to security problems and assess alternatives with the least intrusive effects on privacy and freedom. A holistic approach to security will take the perception of citizens into account and focus on dimensions such as perceived security, proportionality and accountability while displaying awareness of the fact that security risks can be unevenly distributed within and between societies. Proposers should develop solutions strengthening societal resilience and active participation of citizens as security enhancing resources.

Security research can also cover areas of (so-called) '**dual use**' technology relevant to both civilian and defence applications. Appropriate coordination mechanisms are in place with the *European Defence Agency (EDA)*, who will consult its Member States about national programmes, thus ensuring complementarity.

Actions within the Security theme build not only on technology and knowledge gain from the capability projects, but also on research outcomes of other origins. Issues of **European added value** and large scale integration are covered in the theme, and complementarity is ensured with all other EU actions. Complementarity with research carried out in FP7 Associated Countries will be ensured via the members of the Security Programme Committee configuration.

Gender aspects in planning, decisions, and funding must always be taken into account, both as integrated research activities and as diversity in workforce. The pursuit of scientific knowledge and its technical application towards society requires the talent, perspectives and insight that can only be assured by increasing diversity in the research workforce. Furthermore sometimes security needs to be balanced against the accessibility needs of persons with disabilities. Therefore, a balanced representation of diverse branches of knowledge and of women and men as well as persons with disabilities where relevant at all levels in research projects are encouraged, including in evaluation groups etc. On the research output side, awareness of gender-difference is needed in both exposure to security threats and in the impact of security measures.

¹⁹ See separate checklist on how to assess societal impact in Security research projects annexed to the Guide for Applicants.

Security issues could also be regarded as intrinsic elements of **other themes in the Co-operation programme**. The scope of the calls has been carefully defined throughout the themes, in order to avoid gaps or duplication during the entire Seventh Framework Programme. Thus in case of doubt, whether a proposal is fully in scope with the topics presented under this theme, it is recommended to consult as well the work programmes of the other Co-operation themes.

Classified Information

Due to the sensitivity of the Security theme, the *Rules for participation*²⁰ of FP7 foresee the possibility of restrictions to the dissemination of the outcome of the actions on a case by case basis. In particular, special provisions for **classified information** will be taken in the grant agreement, as necessary and appropriate.

For the Security Research Call 6 (FP7-SEC-2013-1), **proposals must not contain any classified information**. This would lead to declaring them ineligible immediately. However, it is possible that the output of an action ('Foreground') needs to be classified, or that classified inputs ('Background') are required. In such cases proposers have to ensure and provide evidence of the adequate clearance of all relevant facilities. Consortia have to clarify issues such as e.g. access to classified information or export or transfer control with the national authorities of their Member States / Associated Countries prior to submitting the proposal. Proposals need to provide a draft *security classification guide*²¹, indicating the expected levels of classification. Appropriate arrangements will have to be included in the consortium agreement.

Positively evaluated proposals involving sensitive or classified information, those involving international co-operation as well as those collaborative projects where 75% funding for research activities for all participants is foreseen, will be flagged to the members of the Security **Programme Committee** configuration and dealt with according to its Rules for Procedure.

Modalities of Implementation: The Research Executive Agency

Call for proposals and other actions under this work programme will be implemented by the Research Executive Agency (REA) according to the provisions of the Commission Decision C/2008/3980 of 31/7/2008 "delegating powers to the Research Executive Agency with a view to performance of tasks linked to implementation of the specific Community programmes

²⁰ *Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013) Article 22*

²¹ 'Security Aspects Letter (SAL)': a set of special contractual conditions, issued by the contracting authority, which forms an integral part of a classified contract involving access to or generation of EU classified information, and that identifies the security requirements or those elements of the classified contract requiring security protection.

'Security Classification Guide (SCG)': a document which describes the elements of a programme, contract or grant agreement which are classified, specifying the applicable security classification levels. The SCG may be expanded throughout the life of the programme, contract or grant agreement, and the elements of information may be re-classified or downgraded. The SCG must be part of the SAL.

See Commission Decision 2001/844/EC, ECSC, Euratom on security, amended by Decisions 2006/548/EC, Euratom and 2005/94/CE, Euratom.

People, Capacities and Cooperation in the field of research comprising, in particular, implementation of appropriations entered in the Community budget".

II. SECURITY RESEARCH CALL 6 (FP7-SEC-2013-1)

This section describes all the topics for which proposals will be called in this work programme. This concerns only the content of the calls. For the practical modalities related to these calls, please refer to section III 'Implementation of calls'. For actions not implemented through calls for proposals, please refer to section IV 'Other actions'.

The primary ambition of the Security theme is to develop innovative security solutions and to facilitate their rapid take-up for the implementation of socially acceptable security policies and programmes.

All seven activity areas, the four mission-oriented and the three cross-cutting areas have topics in the Security call 6. Topics address one (or more) of the following four ambitions:

- important capability gaps (urgent needs that can easily be fulfilled with new solutions based on innovative technologies, and societal approaches),
- validation of solutions resulting from research and development (experimentation involving their appropriation by the end-users),
- core critical capabilities needed by Europe (where technologies are not yet mature),
- high risk / high impact projects (with a view at long-term development of groundbreaking new technologies and other solutions).

The topics that are open to the submission of proposals under the Security Research Call 6 are described in the following seven sections corresponding to the seven activity areas. For each area, the description is taken from the FP7 Cooperation Specific Programme. Then, topics are presented within each area.

Activity 10.1 SECURITY OF CITIZENS

Activities will concentrate on threat aspects of potential incidents of a transnational importance, such as offenders, equipment and resources used by them or as mechanisms of attack. A series of capabilities are required to cope with this mission area, many of which primarily relate to the phases "identify", "prevent" and "prepare" and "respond". The ambition is both to avoid an incident and to mitigate its potential consequences. To build up the required capabilities with the aim of providing civil protection, including bio-security and protection against risks arising from crime and terrorist attacks, emphasis will be on issues such as: threat (e.g. Chemical, Biological, Radiological and Nuclear, CBRN) awareness (e.g. intelligence gathering, collection, exploitation, sharing; alerting), detection (e.g. hazardous substances, explosives, agents B or C, individuals or groups, suspect behaviour), identification and authentication (e.g. of persons, type and amount of substances), prevention (e.g. control of access and movements, with respect to financial resources, control of financial structures), preparedness (e.g. risk assessment; CBRN protection, control of intentionally released biological and chemical agents; assessment of levels for strategic reserves such as manpower, skills, equipment, consumables; with respect to large-scale events, etc.), neutralisation (e.g. missiles, communications, vehicles, non-destructive systems) and containment of effects of terrorist attacks and crime, law enforcement data processing.

Area 10.1.1 Organised crime

Topic SEC-2013.1.1-1 Serious organised economic crime – Integration Project

Description of topic:

Serious organised economic crime is undermining states by reducing their available resources (e.g. reducing tax precepts - for instance TVA fraud counterfeit goods, carburant laundering, arm, drugs, alcohol, tobacco trafficking, etc.) or reducing trust of the citizens (use of false marking of goods, corruption, social fraud) or by directly endangering the functioning of some public services (for instance by stealing copper from energy and railway networks). The objectives of this research are:

- to build an agreed extended European taxonomy and inventory of economic crimes and frauds including the low level or low intensity ones;
- to evaluate their importance both in terms of economic value and loss of state revenue;
- to investigate possibilities for creating a systematic monitoring such activities, including the emergence of new trends and methods and
- to develop a pan European system in order to respond.

New detection solutions and/or methodologies to fighting these crimes/frauds should be developed as an integral part of any proposal.

The proposed project should develop and demonstrate a multi-layered, multi-source pan-European system integrating economic crimes/frauds monitoring systems and new solutions to deter these crimes/frauds. The project should also take into account the legal implications linked to the development of such an EU wide system.

Proposers should take into account other EU and national research projects.

Funding schemes: Collaborative Project (large scale integrating project)

Expected impact:

Increasing awareness of the public at large and of the political personnel on the particular type of crimes/frauds by giving them standardised information both at EU level and each Member State/Associated Country; helping the Law Enforcement Agencies (LEA) and other relevant public authorities doing a better job in fighting these crimes/frauds; increasing the trust of citizens in the proper functioning of states. Proposers are expected to show how the project will strengthen the research base and provide opportunities for new products and services that enhance industry competitiveness.

Topic SEC-2013.1.1-2 “Stronger Identity for EU citizens” – Capability Project

Description of topic:

Identity theft is becoming a major concern not only in the "cyber" world but also in the "real" world. It is a serious crime, often part of organised crime. It covers all forms of identity (civil, financial, medical, social, etc.). The "civil registration" process on which is based our "identity" - which in most European countries was designed under the Napoleonic era - could be improved as well as other identification processes (bank account opening, car registration, etc.) and authentication processes. The weaknesses in these processes make the forging of false documents (paper and/or electronic), notably by using available digital means easier than before.

The research efforts should focus on the protection of individuals and organisations, and, as a minimum, cover the following tasks:

- to build an inventory of the various forms of identity theft in EU Members States/Associated Countries;
- to assess the importance of this threat and its economic impact;
- to develop solutions to prevent or detect identity theft. This can include improved life-long processes, approaches, procedures, methodologies, and technologies against identity theft. These solutions will have to pay a special attention to the respect of privacy and data protection regulations; and
- better services and commercial activity based on the advance made in the area of identity protection.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

A common European approach related to identity theft including:

- proposals for harmonised standards/procedures for tackling identity theft in Europe;
- contribution to identity theft legislation/policies in the European Liberty, Security and Justice Framework;
- innovative approaches and solutions to make identity fraud more difficult;
- increasing information awareness amongst citizens and other stakeholders on identity theft and the subsequent identity recovery; and
- better services and commercial activity based on the advance made in the area of identity protection.

Area 10.1.2 Intelligence against terrorism

No specific topic for this area has been planned for this call

Area 10.1.3 Explosives

Topic SEC-2013.1.3-1 Inhibiting the use of explosives precursors – Capability Project

Description of topic:

Home made explosives are easy to make from readily available materials used for legitimate purposes in everyday life. Basic chemicals (precursors) for the production of explosives are easily accessible. Normal day-to-day household chemicals can be used to prepare more dangerous compounds. Previous FP7 funded projects have started to work on this issue. However, the list of precursors studied in these projects is far from complete. The objective is:

- (a) Identify and work on chemicals not included in previous projects (PREVAIL);
- (b) to obtain better understanding of ‘garage chemistry’: synthetic pathways, one-pot equipment, micro-reactors etc.
- (c) to study the possibilities of preventing their usage for terrorism without harming their normal function or safety properties; and
- (d) to design economically feasible methods of practically materialising some of the possibilities identified in stage (c).
- (e) to work on recommendations for enhancing the level of security for any precursors to explosives identified as “new” threat chemicals

Proposers should take into account other EU (see above) and national research projects to avoid duplication.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

This action should contribute to improve the traceability of chemicals and mitigate their properties that can be used in the preparation of terrorist actions, and therefore contribute to preclude such unwanted use. The action would also provide early information on suspicious use and thus help monitor the use of such chemicals to prevent terrorist events. The action should be complementary to ongoing and past EU actions, as well as currently proposed EU regulatory framework in this matter.

Area 10.1.4 Ordinary crime and forensics

Topic SEC-2013.1.4-1 Smart and protective clothing for law enforcement and first responders – Capability Project

Description of topic:

Law enforcement authorities, private security personnel, disaster relief personnel, and other civilians in hostile situations (e.g. journalists) wear various forms of clothing to protect against deliberate threats against the person and/or various types of hazards.

The objective is to improve current technology and develop a new kind of functionality and effectiveness of protective clothing. An important objective is to provide higher degrees of protection from clothing that can be worn in normal operations. Issues to be included could be: seamless, lightweight, cost-effective, easy to use, wearable for security personnel in real life operations, including innovative concepts for stab/ballistic-resistant wear; sensors; embedded health monitoring of the wearer; communication and positioning linked to command and control. It is also to offer a greater protection over more of the body (arms, legs, feet, hands, head), in particular, protection for very vulnerable points on the body (vulnerable blood vessels, vulnerable nerves, etc).

Proposed projects should build upon knowledge generated in European and national research projects on multifunctional protective clothing. International standards and guidelines for protective clothing should be taken into account. Evaluation methodology, evaluation and validation of the developed technologies are expected.

Proposers can choose to cover only the protective clothing for law enforcement personnel or for first responders.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

The projects should offer all intervention personnel a greater protection and increased safety in their daily work, and contribute to standardisation activity and to develop common EU requirements in order to facilitate an EU wide market. It is expected that the outcome of these projects will be developed and validated by the end-user community. A clear potential for exploitation of the results, within the EU and world-wide is expected, given also the interest by the EU to contribute to a growing vibrant and globally competitive European security SME

and industry sector and to generate employment. A significant and demonstrable impact for end-users is also expected.

Topic SEC-2013.1.4-2 Development of a Common European Framework for the application of new technologies in the collection and use of evidence – Coordination and Support Action (Supporting Action)

Description of topic:

Thanks to technological advances in information gathering, Law Enforcement Agencies (LEAs) are able nowadays to obtain evidence, when carrying out criminal investigations, in very effective ways that were impossible a few years ago. However, legislations on criminal procedures in many European countries were enacted before these technologies appeared, thus taking no account of them. As a result of this, three very important problems appear:

- (1) The admission in Court of evidence obtained this way is frequently uncertain, giving judges no clear criteria on its admission and assessment, and therefore causing uneven application of the law.
- (2) These new technologies can lose their efficiency quickly, as soon as criminal organisations become aware of their existence, obtain technical details about them and adopt countermeasures. The absence of standards and regulations protecting them from having to be publicly exposed during trials, burn them out as soon as they are used. This is particularly valid for criminal transnational organisations, usually having almost unlimited resources.
- (3) Globalisation of criminality requires the tight collaboration of the law enforcement and judiciary systems of different countries: evidence obtained in a State has to be shared and accepted in other States, while simultaneously observing fundamental rights and substantial or procedural safeguards. The lack of legislation and standards at the national and international level obviously makes this particularly difficult.

To address these problems a complex set of coordinated developments is required, by different actors, at the legislative, standards, technology and law enforcement levels. A specific framework of standards, guidelines and recommendations is needed. Therefore, the objective of this topic is, from a multidisciplinary point of view, to identify, define, assess and articulate the whole set of actions that should be carried out in a coherent framework, including at least the following aspects:

- A comparative analysis of existing legal provisions which apply in these cases and their impact.
- The identification and definition of those legislative changes that should be promoted both at the European and State level.
- The definition of open standards, assuring not only the international transfer of evidence but also the chain-of-custody requirements and the protection of the means of proof, without forgetting the ethical and privacy aspects.
- Operational and ethical implications for law enforcement agencies (LEAs).
- The identification of those technical developments that should be carried out to sustain all these aspects.

The proposing consortium is expected to incorporate in addition to experts on criminal procedure from a variety of European countries, a significant number of LEAs specialised in information gathering with technological means and at least one R&D technological partner, who should ensure the technical feasibility of the proposed solution.

Funding schemes: Coordination and Support Action (Supporting Action)

Expected impact:

A research agenda covering the issues raised is expected as well as an evaluation of the market size targeted by the technological development. Action in this area should raise sufficient awareness and understanding of all relevant issues for the take-up of their outcome (e.g. regarding harmonisation and standardisation, international and EU co-operation needs, etc.) and raise the awareness of the EU political stakeholders in order to help them to shape a proper legal environment for such activities at EU level and to demonstrate the added value of common practises and standards.

Area 10.1.5 CBRN protection

Topic SEC-2013.1.5-1 European toolbox, focusing on procedures, practices and guidelines for CBRN forensic aspects – Capability Project

Description of topic:

Forensics research plays an important role in solving crime and maintaining secure societies. Novel methods for CBRN forensics and training would strongly enhance these capabilities.

Proposals should aim to develop and provide a forensic toolbox (either fixed or mobile) focusing on procedures, practices and guidelines for common CBRN forensic measurements and handling instructions on a European level, such that results can be used during legal prosecution to provide solid and court-proof forensic evidence in and after CBRN incidents. This includes practices for sampling, preservation, shipping and storage, analysis, laboratory equipment and recording in the context of criminal events. Guidelines and procedures should include issues like Good Laboratory Practice (GLP), Quality Assurance (QA), Quality Control (QC) and Standard Operating Procedures (SOPs).

Whilst developing procedures, practices and guidelines, projects should give adequate attention to aspects of usability, societal acceptance and economic and legal viability, through appropriate research, experimentation or demonstration in realistic, complex and scalable scenarios and contexts.

Proposed projects should build upon knowledge generated and liaise with on-going FP7 funded and nationally funded projects in the forensic area. Where necessary new technologies should be developed for sampling, analysing evaluating, interpreting and recording forensic evidence with a view to achieve court-proof results.

Common European CBRN forensic procedures are indeed useful to provide guidelines on how to act in CBRN incidents, in particular how to sample, analyse, evaluate, interpret and record forensic evidence and achieve court-proof results.

Testing and validation on the field with relevant end users are expected in order to illustrate the EU added value of such an initiative. It should also include key qualitative and quantitative indicators to measure progress or results achieved during the project compared to the state of the art.

This research relates particularly to the goals outlined in the EU CBRN action plan.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

On security of citizens: This project will make available common procedures, practices and guidelines for CBRN forensic aspects. It will therefore provide a solid legal hold concerning CBRN forensic aspects. Potential users of the expected developments will be both public and/or private users.

On industry competitiveness: this project should deliver common procedures, practices and guidelines, as well as where necessary new technologies, leading to common methods for CBRN forensics. Thus industry will have a solid and common basis to develop and deliver appropriate products for forensic analysis. While the market for such technologies is rather specialised and limited, it is expected that economies of scale will be achieved by delivering a European solution, overcoming fragmented national markets and helping to maintain global competitiveness of the European companies, which are predominantly SMEs.

Area 10.1.6 Information gathering**Topic SEC-2013.1.6-1 Framework and tools for (semi-) automated exploitation of massive amounts of digital data for forensic purposes – Integration Project****Description of topic:**

Law enforcement investigations increasingly lead to very large amount (terabytes) of data. The task is to develop new methodology/tools to derive from these various types of data (text, audio, images, video, etc.) evidence that will be acceptable by courts in Europe. The proposed solution should:

- do an automated first treatment of such large set of data in order to limit the human intervention in the analysis to a minimum;
- propose guidance to analysts in order to help them manage the results of the first processing;
- be able to link and merge information with other sources;
- present relevant highlights to the analysts to allow them to refine the process; and
- integrate tools allowing the treatment of scanned calligraphic documents.

In addition, the proposed solution should propose to develop modelling and simulation in order to test operational procedures and techniques and to facilitate the training of analysts and operators.

Demonstration of the developed capabilities and of their integration is required.

The project will have to deal with the management of personal data, and related ethical and legal issues. Therefore considerable attention will have to be given to privacy and data protection, and to the adherence to European regulations. For each proposed solution, potential issues vis-à-vis these rights and regulations will have to be analysed, and recommendations on the best solutions to these issues must be proposed.

Proposers for this topic should look for an enhanced SME participation as described in Part 1 of the work programme.

Funding schemes: Collaborative Project (large scale integrating project)

Expected impact:

It is expected to develop new tools, techniques, processes and procedure to support investigators, analysts in their daily work; to start to develop standardisation activities based on common methodologies, tools, procedures in the forensic area; to raise the awareness of Law Enforcement Agencies (LEA); to raise the training and the technical skills of analysts.

Topic SEC-2013.1.6-2 Novel technologies and management solutions for protection of crowds – Integration Project**Description of topic:**

The objective is to develop new solutions (methods and tools) for protecting crowds gathering in short notice and temporary events, such as political rallies, sport events, entertainments shows, rave parties, “facebook events”, etc, where the assets to protect are mainly the people and their surroundings. The number of such public gatherings, often involving large crowds, is increasing. They can be hard to manage, generate disorder or be attractive for attacks. The protection of these gatherings is a growing concern.

Novel solutions are needed to handle their security. These solutions should allow a fast deployment /tear down process and an easy adjustment to the specificities of the event (size of crowd, physical perimeter, type of potential risks, etc.). Modularity and mobility are key characteristics, and the same equipments should be used in the various types of events as much as possible. The needs for EU standards should be studied, in particular in view of facilitating the potential equipment market.

These solutions also require tools to understand and analyse the patterns of people activities. Especially within the psychological component, more understanding is needed about physiological, cognitive and social perspectives and on the integration between them, on the individual level, and on those of groups and crowds. The methodologies and tools should lead to a more harmonised and structured, but context-based approach. Besides this, they should be evidence based, generally applicable and demonstrated for a diverse range of scenarios, and completely compatible with the latest insights on ethics and privacy by design.

The research effort should focus on the following aspects:

- analysis of the different types of public gatherings, their evolution, the risks associated and the constraints on protection and security measures;
- fast deployment of various sensors (including self-deploying and autonomous sensors) and access control capacities (including cooperative and uncooperative);
- an architecture that allows a fast deployment of the overall security system as well as the tools to monitor, control and command the deployment capacities;
- scalability of the equipment to fit the specific needs of the event;
- plug-and-play and low energy consumption sensors for surveillance;
- mobile Post of Control connected to “outside” authorities’ networks;
- a simulation tool to quickly define the configuration for a specific event, evaluate the adequate capacities to be deployed and to train intervention personnel;
- a tool able to extract structured information from an unstructured and multi-domain source as social networks are;
- intervention strategies on how to apply this knowledge in specific security contexts;
- the effects of these intervention strategies on the effectiveness and efficiency of security professionals in different scenarios;
- intervention strategies on how to apply this knowledge in specific security contexts;

- the effects of these intervention strategies on the effectiveness and efficiency of security professionals and people gathered in crowds in different scenarios; and the
- integration of all these solutions into real systems.

The proposed solutions should be as little intrusive as possible. The potential privacy and ethical issues linked to their implementation will have to be addressed, and corresponding recommendations provided for the management of the deployed system. Security forces should be involved in the project. The research should build on previous EU or national projects.

Proposers need to take fully into account the respect of privacy and the democratic rights of individuals as stated in the EU Charter of fundamental rights. The solution proposed should be ethically acceptable. The creation of an ethical advisory board is recommended.

Proposers should take into account other EU and national research projects.

Proposers for this topic should look for an enhanced SME participation as described in Part 1 of the work programme.

Funding schemes: Collaborative Project (large scale integrating project)

Expected impact:

The outcome of the project should provide a general architecture of a solution for the protection of crowds, a set of technologies suited for this goal, as well as simulation tools to prepare for the protection of specific events. A demonstration of such a solution, which can be easily and quickly implemented to handle the security of temporary events involving large crowds, will be carried out. The project should also prepare standardisation activity in the area with a view to facilitate an EU market for such systems. Emergency management tools will also benefit from the outcomes of the research by incorporating new information sources and assets that can improve incident reaction times and effectiveness.

Topic SEC-2013-1.6-3 Surveillance of wide zones: from detection to alert – Integration Project

Description of topic

The EU suffers from a lack of affordable solutions for large ground areas surveillance such as for instance rail tracks, energy lines, pipelines, highways, etc.

One objective is to integrate ground and/or airborne sensors, to detect, to identify and localise illicit patterns of activity (detection of change or surveillance 24/7) on a wide area.

The aim of this Topic is to go beyond existing research projects and address the systemic and holistic issues (cost sensors, networks and cooperation of sensors, innovative algorithms for data interpretation, correlation and user interface, etc.). Research should also provide a comprehensive analysis on vulnerability, security of the system itself and related system design methodology. A demonstration of the full system is expected.

In addition the research should cover the gathering of information, its qualification and its use for alerting. Costs, integration, efficiency (positive or negative rate of alarm) and maintenance of the system should also be studied.

Solutions are to be developed in compliance with European societal values, including privacy issues and fundamental rights. Societal aspects (e.g. perception of security, possible side effects of technological solutions, societal resilience) have to be taken into account in a comprehensive and thorough manner.

Proposers should take into account other EU and national research projects.

Funding schemes: Collaborative Project (large scale integrating project)

Expected impact:

The common proposed solutions would benefit many European countries, for transnational applications, and would improve the interoperability in terms of data and information exchanges. Research should also contribute to standardisation activities, interoperability and create a level playing field for industry.

Topic SEC-2013-1.6-4 Information Exploitation – Integration Project

Description of topic:

This project aims to facilitate a leap forward in the capabilities to exploit information.

Police and law enforcement agencies (LEAs) often collect, obtain or possess very large quantities of data and information from various sources. These public authorities have a variety of requirements to analyse these large quantities of data and information to produce actionable criminal information and intelligence.

These entities have needed these capabilities for years, but require further improvements and advances. Research should therefore consider what has already been developed, and avoid developing any of the existing technologies and analyses for a second time. A cost benefit analysis should be carried out with regard to the proposed developed capabilities. Proposers should develop and integrate privacy aspects at the design stage of the research.

The tasks are to:

- manage the explosion of data (static or dynamic) in terms of volumes, speed, variety, content;
- develop and make systematic use of anonymisation techniques;
- undertake content analysis to understand semantic and conceptual meaning of information in order to identify relevant information rapidly;
- analyse data and information in order to identify metadata, patterns while improving data fusion techniques etc;
- conduct rapid searches based on meaning and concept;
- analyse the meaning of information in order to detect suspicious information;
- detect, identify, isolate, and generate evidence of terrorism or serious organised crime;
- generate indicators and warnings of imminent acts of terrorism or serious organised crime, including those within cyber space;

and also to:

- present the relevant highlights of this information to the operator/analyst;
- facilitate training of analysts and operators.

The project should deal with the management of personal data, and related ethical and legal issues. Therefore considerable attention will have to be given to privacy and data protection, and to the adherence to European regulations. For each proposed solution, potential issues vis-à-vis these rights and regulations will have to be analysed, and recommendations on the best solutions to these issues must be proposed.

The establishment of an independent ethical advisory board is recommended.

Demonstration of acquired capabilities is expected. The developed capabilities need to be validated by an appropriate group of end-users (national or European LEAs, etc.).

Proposers should take into account other EU and national research projects.

Funding schemes: Collaborative Project (large scale integrating project)

Expected impact:

The output from this research topic should include new innovative, efficient and effective capabilities, approaches, tools, techniques, processes and procedures to support police and LEA, to prepare against, prevent and discover serious organised crime, fraud and terrorist acts taking into account the complex IT of today.

The benefits of this research should include a significant improvement in the prevention, detection, investigation and prosecution of serious and organised crime and terrorism, and thereby to more effective and efficient law enforcement. It is also expected that the results of this research will be tested for their societal acceptance.

Activity 10.2 SECURITY OF INFRASTRUCTURES AND UTILITIES

Activities will concentrate on targets of an incident or disaster of transnational importance, examples for infrastructures include large-scale event sites, significant sites of political (e.g. parliament buildings) or symbolic (e.g. particular monuments) value and utilities being those for energy (including oil, electricity, gas), water, transport (including air, sea, land), communication (including broadcasting), financial, administrative, public health, etc. A series of capabilities are required to cope with this mission area, many of which primarily relate to the phases "protect" but also "prepare". The ambition is both to avoid an incident and to mitigate its potential consequences. To build up the required capabilities, emphasis will be on issues such as: analysing, modelling and assessing vulnerabilities of physical infrastructure and its operations; securing existing and future public and private critical networked infrastructures, systems and services with respect to their physical, logical and functional side; control and alert systems to allow for quick response in case of an incident; protection against cascading effects of an incident, defining and designing criteria to build new secure infrastructures and utilities.

Area 10.2.1 Design, planning of building and urban areas

Topic SEC-2013.2.1-1 Evidence based and integral security concepts for government asset protection – Capability Project

Description of topic:

Maintaining government continuity and societal stability after a severe incident is a vital challenge for open western societies; both in their homeland and abroad through embassies and delegations. Attacks like the recent Oslo bombings show that the current way of concentrating government buildings in urban areas can be vulnerable. In an urban area, the difficulty is the number of people that are in or nearby a building. This stresses the importance of creating resilience in the functioning of public offices. Security measures on persons, buildings and events are interrelated, but often lack a consolidated approach. This stems from the lack of evidence (study) based security concepts and security management structures. There is a need to do more scientific research to provide a more solid knowledge base for the much needed integral security approach covering both homeland and overseas (embassies, delegations, missions etc), including research into novel technologies that would support such resilience

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

The challenge is to create the optimal mix of security measures, based on an all risk approach. Proposers should develop security concepts to put these measures in place covering both homeland and overseas (embassies/delegations etc) security issues. This needs to be done in cooperation with multiple other public and private organisations. Undisputed knowledge of the best security concepts is currently missing. The research should result in a knowledge base IT tool that shall provide educational programmes for the management of security and pave the way for a more integral security approach. It should help (public and private) professionals dealing with security to better coordinate building security, with closed protection and event security. Moreover a common European approach of this issue should be taken into account.

Topic SEC-2013.2.1-2 Impact of extreme weather on critical infrastructure – Capability Project

Description of topic:

The frequency of different natural catastrophes caused by extreme weather conditions induced by climate change is expected to increase. Centuries old buildings have suddenly been demolished by floods, earth slides, or hurricanes. Power delivery has failed during heat waves. The functioning of critical infrastructures (electricity generators, telecommunications, public health, transportation, financial services, food and water supply, etc.) are more and more threatened because of the changing weather condition, including drought and heat waves, some of which societies are unprepared for.

The regionally differentiated risks need to be reassessed. A better understanding of factors and the elements to include in risk analysis of societal security should be developed. Moreover, research work under this topic should identify in a systematic way the European and national critical infrastructures that should be re-assessed for extreme weather risks. Technologies to protect against extreme weather should be reviewed and beyond the state of the art improvement should be developed.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

The project should bring together climate researchers, meteorologists, first responders, with critical infrastructure owners, operators and planners. A review of European critical infrastructures needs to be carried out - those that are most threatened by various risks are to be identified and classified. Measures to protect these should be suggested so major catastrophes and/or cascading effects could be prevented. Simulations are to be performed and the effectiveness of the measures needs to be quantified.

Specific feature: Projects selected under this topic will be linked through a coordination mechanism that will be defined during the negotiation stage. Coordination with related actions under the Environment Theme²² will also be established. Costs of this coordination will be covered by project resources.

Area 10.2.2 Energy, transport and communication grids

Topic SEC-2013.2.2-1 A research agenda for security issues on land transport – Coordination and Support Action (Coordinating Action)

Description of topic:

The objective is to develop a research agenda which provides concrete answers to what type of security related projects should be developed in the future. Different transport modes i.e. road, rail, air, maritime (through ports) and inland waterways have become more integrated and have thus created new security risks that need to be carefully managed. Terrorist have taken the transport sector to be an easy target (stations, tunnels, urban transport systems, etc). The task is to analyse the different land transport modes and their interconnections points from the point of view of security and to develop a future research agenda for this sector.

Funding schemes: Coordination and Support Action (Coordinating Action)

Expected impact:

The study outputs are therefore expected to provide a clear state of play of security issues in land transport, including looking into new threats such as cyber attacks. This implies that the interconnection and the integration dimension should also be taken into account. Moreover global guidelines on enhancing the surveillance of the land transport infrastructure in order to ensure the security of citizens and of critical infrastructure against terrorist threats should be assessed.

Topic SEC-2013.2.2-2 Toolbox for pandemics or highly dangerous pathogens in transport hubs – Capability Project

Description of topic:

Natural or deliberate release of pathogens in large transport hubs (railway stations, bus stations, airports, etc.) could affect people travelling across Member States borders and have a major impact across the EU and even other countries. Worldwide travel of people for both

²² See Work Programme Environment: ENV.2013.6.4-4 Towards stress tests for critical infrastructures against natural hazards – FP7-ENV-2013-two-stage

leisure and business is increasing and as a consequence, probability of uncontrollable spread of infectious disease is also increasing significantly

In this context, the aim of the proposal is to provide at least one of the two following outcomes:

1) Guidelines for first responders and transport operators to prepare and handle pandemics situations in transport hubs. Proposed guidelines should be tested in a variety of large stations across the EU, with the strong collaboration of the end-users and transport authorities. The guidelines should, in particular, focus on coordination capacities for the different security and safety agencies, and also transport operator management teams, to provide unified response based on event-based information sharing. They should take into account local and national particularities and experiences.

These guidelines should be easily understandable and accessible for operators/end users and possibly translated in national languages if required by end-users. They should be widely shared and disseminated among first responders and transport operators. The use of common symbology is encouraged to avoid translation barriers.

2) An integrated toolbox to prepare for and respond to a deliberate release of pathogens in a major transportation hub.

It could include (not exclusively):

- Reference scenarios
- Incorporation of prevention and surveillance tools and technologies
- Rapid detection capacity
- Operational guidelines at the incident site level as well as to the cross border level
- Decontamination tools for the crowd and the facility
- Tracing tools for the potentially exposed, focusing on the multi-national aspect of major transportation hub.
- Epidemiological investigation tools focusing on the cross border dimension and required cooperation.
- Legal and ethical study of the implications of an incident involving multiple nationalities, possibly vessels of foreign countries and the acceptability of the suggested measures.

The proposal should take into account technologies and results of FP7 and national projects in this area, as well as other ongoing EU policy activities in this area (e.g. Health security initiative). Their complementarity and added value should be explained and justified.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

Objective 1) Final guidelines (following assessment and testing by end-users) will provide a clear view of the possible threats of pandemics to transport sector in transport hubs and give orientation on how to deal with the pandemic issues. They will contribute to improve the rapidity and safety of rescue operators and save lives (both of potential victims and rescue teams).

Objective 2) The project should create a clear threat analysis to the occurrence of a deliberate release of a pathogen in a major transportation hub in Europe. It will provide an integrated toolbox and will lead to a comprehensive view of the cross border implications of such an incident, accompanied with the tools to – rapidly detect the incident, mitigate its effects on the

site, and respond to the dispersal at the site level and mainly at the multinational level dealing with tracing of the patients, off site decontamination of vessels and sharing of information.

Topic SEC-2013.2.2-3 Protection of smart energy grids against cyber attacks – Capability Project

Description of topic:

A smart grid²³ is an electricity network that can efficiently integrate the behaviour and actions of all users connected to it – generators, consumers and those that do both – in order to ensure economically efficient, sustainable power systems with low losses and high levels of quality and security of supply and safety. The future energy distribution network (smart grid) requires such services to be implemented that can monitor in real-time the overall conditions of the grid system and its main components; reduce vulnerabilities and minimise the effects of an attack. The objective is to analyse the smart grid system and then to develop ways to make the system more resilient and less vulnerable to cyber attacks. Methodology and tools should be developed for a high-level security risk assessment in order to minimise the impact of cyber attacks on the smart grid. Moreover, the project should contribute to raising awareness of stakeholders.

Proposers should also take into consideration the use of smart meters as part of the smart grids. The use of smart meters should however be closely analysed regarding its compatibility with EU and national legislation.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

Proposers will provide a clear view to policy makers and other stakeholders of the possible threats of cyber attacks on smart grids. Manufacturers and providers should be encouraged to include security measures and procedures in their devices and equipments. Most importantly the proposed research shall assess the vulnerability, propose new security standards/technology, monitoring tools, carry out tests, demonstrate scenarios and propose materials to improve the resilience of the smart grid. Demonstration activities should be envisaged under almost real conditions, using a comprehensive interoperable smart grid/smart metering test bed able to evaluate the performance of the whole system. Cost assessment of the development and implementation of the protections should be included.

Topic SEC-2013.2.2-4 Cost effectiveness of security measures applied to renewable/distributed energy production and distribution – Capability Project

Description of topic:

Energy production and distribution are part of critical energy infrastructure. With the increasing use of renewable energy sources, the number of production points is increasing, so transmission and distribution networks are getting more complex. Currently there are no cost-effective security systems for wide area protection (e.g.: electrical distribution grids, solar farm, wind farm). This makes energy grids vulnerable to attacks. Renewable and distributed energy production should be economically effective for providing supply and ancillary services to help ‘operators to operate’ their networks, for example, providing voltage control

²³ See the definition from the EU Commission Task Force for Smart Grids at http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/expert_group1.pdf

and reactive power support. The objective is to analyse the risks and threats related to this architecture and the development of cost-affordable technologies to protect them.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

Through an innovative and cost effective approach the research should analyse the added complexity and vulnerability introduced by renewable/distributed energy into “conventional energy grids”, to detect the most sensible points and to develop cost-effective solutions to provide early warning of suspicious activities in a distributed energy grid. The system will take into consideration the special characteristic of the renewable energy infrastructures (wide open areas), designing a solution which both respect privacy and is easily deployable. Moreover, the research shall provide a common European approach related to this issue.

Topic SEC-2013.2.2-5 Security of ground based infrastructure and assets operating space systems – Capability Project

Description of topic:

The task is to assess the vulnerabilities of the space control ground stations, in particular those used by earth observation and satellite navigation systems, and secure communication links to satellites which are seen as critical infrastructure and when possible to propose new methods of protection without making strong assumption about the satellite itself.

The research shall focus on the following points:

- Develop risk assessment tools in order to identify specific vulnerabilities of the space control ground stations;
- Develop risk assessment tools in order to identify specific vulnerabilities of the telecommunication links with the satellites and the space control ground stations;
- Develop tools and where necessary new technologies to protect these critical infrastructures (facilities and telecommunications links but excluding the satellite itself) against deliberate acts of terrorism, sabotage and cyber attacks etc; and
- Due to the distributed network architecture of the space control ground stations, carry out contingency analysis that shall provide an innovative and cost effective plan for an automatic restoration and intelligent reconfiguration in case of failure of a part of the space control ground stations network.

These sites can be targets of deliberate acts of (cyber) terrorism, sabotage, criminal activity, malicious behaviour etc. or they can simply be affected by accidents, natural disasters, negligence and so on. Therefore if they are destroyed, damaged or disrupted it can have significant impact on the global space communication and use of space applications. Furthermore it could impact on the overall functioning of the society (security of telecommunications assets, strategically and economically etc).

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

It is expected that action under this topic shall provide significant improvement in the security and resilience of complex interconnected space control ground station networks. Research shall analyse in an innovative way the vulnerabilities of the different parts of the space control ground station network and provide state of the art tools and innovative solution in order to limit the impact of accidents/attacks etc on these networks.

Area 10.2.3 Surveillance

No specific topic for this area has been planned for this call.

Area 10.2.4 Supply chain

Topic SEC-2013.2.4-1 Phase II demonstration programme on logistics and supply chain security

Description of topic:

The European Union (EU), and nations around the world, depends upon the efficient and secure transit of goods through the global supply chain system (i.e. the network of assets and infrastructures by which goods are moved from the raw materials transportation until they reach an end consumer, as well supporting communications and information sharing infrastructure). This system is a critical infrastructure essential to both the EU's economy and security. Indeed, the same interdependencies that promote economic activity also serve to propagate security risk.

For this reason, the EU needs to maintain or improve supply chain security levels, whilst also expanding transport and logistics networks to enable industry throughout the Union to have effective access to the Single Market and the international markets.

Protecting and securing the supply chain from exploitation, and reducing its vulnerability to disruption, goes in parallel with the promotion of a timely and efficient flow of legitimate commerce. Security processes are to be integrated into supply chain operations whilst ensuring that process efficiency is maintained or even improved. Any solution to be developed should strike a balance between public and business interests, within recognised regulatory constraints.

What is needed is a European approach to a system that operates in an international context and supports the implementation of the various EU security and information management policies and directives, with evolving international regulations and standards, whilst at the same time offering tangible benefits to involved stakeholders (transaction, transport, regulatory and financial stakeholders), thus facilitating its adoption by commercial entities.

The challenge to maintain or improve security levels, while also improving the facilitation of movement of goods, is a difficult one. The likelihoods, scope and economic consequences of illicit trade and organised crime/ terrorism/ disasters related acts, and transport infrastructure failures, cannot be fully anticipated. Efforts are needed to foster a resilient system that would be better prepared for, and can withstand, evolving threats and hazards, and that can rapidly recover and react on disruptions. The efficiency and degree of success of security measures (covering awareness, prevention, protection, detection, response and recovery) are difficult to quantify. Improving security requires an integrated research and development approach, including risk assessment, traceability, secure exchange between nations and across operators, and fast but effective screening. Large scale R&D pilot implementations of integrated approaches are possibly the only route to catalyze the critical mass required to discover the practical problems and to propose solutions that could deliver sizable and sustainable progress in supply chain security across all EU Member States/Associated Countries and on a global scale.

There is a consensus worldwide that the implementation of security policies should be risk management based, cost effective and efficient for supply chain processes. Given the intrinsic complexity and the division of their institutional roles, public security (i.e. police, inspection, law enforcement) authorities find it hard to cover the supply chain holistically. Their efforts need to be harmonized with those of customs and transport authorities. In addition, cooperation between the public and private (business) domain (i.e. shippers, forwarders, terminal operators, transporters, insurance) is essential to develop a coherent security approach. Indeed, it is very much also up to the private sector to develop and implement its own security measures (i.e. to prevent an incident from happening or those aimed at getting an interrupted supply chain back into shape as soon as possible).

In order to maximize the flow of legitimate trade, new mechanisms to minimize the security disruptions and facilitate low risk cargo and appropriate processes to simplify trade compliance should be envisaged and refined incentives proposed to enhance the collaboration of stakeholders. Targeting capabilities are only as good as the data gathered: the customs consider reliable, accurate, complete data for efficient risk analysis as the key enabler for the security of the supply chain.

Customs control for internal security purposes as well as consumer protection, health and safety purposes has been an integral part of customs control work at Member State level. Since the 2005 'Security Amendment' of the CCC in particular, the 'security and safety' dimensions of customs control work have also been incorporated into the customs union policy acquis, and is fully operational since 1 January 2011. The fact that the customs is constantly present at the border and has a longstanding knowledge of the goods moved within the supply chain, places it as one of the primary authority able to detect and prevent illicit and dangerous goods from entering into and leaving the EU.

In practice, customs activity is that of an enforcement authority, which often means implementing the policy priorities of several policy areas at once. Therefore customs co-operation across the EU takes a range of forms throughout the whole EU external border, whether maritime, air or land border. In addition, to respond to multiple types of risks, customs risk management and control must by nature be holistic. This includes the use of state of the art data integration and management systems for risk analysis purposes, the application of a variety of equipment and technology tools for the detection of illicit and dangerous goods, sophisticated laboratory testing for security and safety as well as for fiscal purposes. Furthermore, customs carries out control at the most effective place/moment of the supply chain, which requires efficient communication systems and also the use of modern audit approaches (system-based approach) and post clearance type of controls. Customs thus has to use a variety of co-operation approaches, risk management and control working methods, techniques and equipment.

The Commission coordinates customs risk management related to international trade with third countries, enhances supply chain security and trade facilitation through management of the EU AEO programme, international mutual recognition thereof and the development and use of innovative technology to detect illicit cargo.

Data platform concepts and proprietary systems have so far failed to achieve wide acceptance, remaining restricted to niche markets and to few stakeholders. Indeed, they rely on trusted partners willing to share data (such trust may not be present in the commercial competitive environment, where information related to the supply chain may also represent a key asset for business). The definition and guarantee of the control and the sovereignty of data (who owns

the collected data?) is an important issue to be taken into account. Another issue to be taken into account is the cost vs. benefit for security devices/systems.

In this general context, the scope for capacity building via this demonstration project/programme is identified in the following areas:

Tools & Standards

- Facilitation and expedition of the smooth flow of legitimate trade through the use of multilayered risk management tools and mutual recognition of international trade facilitation programmes that build redundancy in the system, so security breaches can be addressed in subsequent levels. Also aspects of traceability and inviolability are paramount to be addressed.
- Reduction of the costs of security controls, by recognition of the high standards of the controls performed by other authorities,

Prevention & Protection

- Prevention of illicit movement of dangerous and illicit material throughout the supply chain, like trafficking, contraband and fraud, terrorism (including cyber-terrorism or dual use of goods with malevolent intentions) or piracy.
- Protection of critical elements of the supply chain system and the consequent threats to the economic and civil society from attacks (including cyber attacks), theft and disruptions (i.e., unlawful interferences in the supply chain flow), via better understanding and addressing of vulnerabilities for criminal exploitation and to natural events,

Resilience

- Building the resiliency of the supply chain (to either man made or natural events).

Whilst technology plays a critical role in ensuring the security and efficiency of the supply chain, it must be stressed that the appropriate use of technology is only one element in the layers of defence to protect against the range of possible traditional and asymmetric security threats. Technology addresses the potential weaknesses of other implemented layers, therefore it does not replace a credible advance cargo (and people) risk assessment based on sound data. In addition, the importance of the human factor cannot be underestimated. Physical transportation security and cargo monitoring needs to be complemented by good practices, guidelines (e.g. for security awareness and risk management), standards and regulations (e.g. for authentication, certification and data protection), and by properly trained and equipped personnel.

The association with multilateral organisations with responsibilities for possible components of the proposed solutions (such as WCO, ICAO, IMO, ISO or UPU) is considered as an additional asset for the project/programme to attain its goals, with a view to the possible international promotion of mutual recognition of trade partnership programmes and controls, and of security measures.

The proposed activity should not duplicate R&D already undertaken by other FP7 activities. It should rather, where appropriate, critically take account of the outcome of such projects, particularly in terms of integration of systems, data harmonisation and standardisation.

The demonstration priorities between the supply chain disruptions, crime types and terrorism should be based on solid economic and societal impact assessments, such as incidents with the highest total economic impact; worst damages to governments and citizens; worst (physical / financial / reputation) damages to cargo interests and logistics operators; broad facilitation of other (more lucrative) crime types; and (foreseen) growing trends in crime and terrorism.

The proposed programme may consist of parallel coordinated projects (as part of the same grant to ensure an integrated approach). In this case it will have to be firmly structured on the basis of clearly defined objectives and representing different supply chains/freight flows and could be based on economic or activity sectors which are key for boosting Europe out of the crisis because of their economic or social relevance. The project/programme should consider all relevant types of actors (customs, administrations (including public services such as postal supply for packaging distribution), transportation authorities and operators, private sector, etc.) cover different modes of transport (as appropriate), considering the most relevant categories of cargo (ISO, container, semi-trailer, swap bodies) from end-to-end.

A basic element of a successful project/programme will be the active participation, from its initial definition phase, of customs regulatory agencies and law enforcement authorities, together with other agencies nationally and internationally involved in the security of the supply chain. These authorities should be complemented by industrial (e.g. technology and integration providers) and commercial companies, with a focus on consignors, consignees and logistic service providers. The proposal should outline the benefits and incentives expected for all the parties involved. In particular, it should address the requirements and benefits of end-users (shippers) through combining their needs for facilitation and cost and processes efficiency with enhancing supply chain security.

Work is suggested to be undertaken on the basis of scenarios, simulating real operational conditions, following the setting of priorities on the basis of identified threats, risks (including novel) and security gaps, also with a view to assess resiliency (in terms of business processes) and good practices. The field-testing may provide evidence about the strengths and weaknesses in identified individual areas of the supply chain.

In as much as national supply chain security policies will be ineffective unless they are supported by enhanced international cooperation to guarantee their coherence, compatibility and cost effectiveness, proposers for this topic should look for an enhanced international cooperation (as described in Part I of the work programme).

The valuable participation of qualified research performing SMEs shall be considered as a factor of merit of the proposal.

Funding schemes: Collaborative Project (large scale integrating project)

Expected impact:

The demonstration project/programme is expected to deliver tangible results at its end and to provide an impact analysis for the proposed supply chain measures. In particular, it should demonstrate the potential to increase the overall level of security, by integration of the security requirements without disrupting logistics process flows. Adequate measures shall be demonstrated for securing business (i.e. costs vs. benefits, performance, practicability, and

acceptance) and performance standards, and requirements for such measures provided (to be also acceptable by SMEs).

Solutions are expected to demonstrate the added value of integration of systems and processes to contribute to more secure international supply chains. More specifically they should contribute to:

Tools & standardisation

- propose, towards end-to-end supply chain security, an appropriate mechanism for transparent multi-hazard risk assessment, which identifies not only the specific risks in the chain, but also correlates with the methods applied by public authorities (e.g. the risk method developed for the AEO);
- increase the overall security of the supply chains by fostering harmonisation, standardisation, mutual recognition, responsibilities of stakeholders and interoperability maintaining the efficiency level and the costs of trade, thereby enhancing mechanisms for the secure exchange of security information;

Prevention & Protection

- what will be the possible solutions to new risks and threats required to secure supply chains in 2020? How to protect the EU and its citizens against these new threats.
- identify suspicious cargo (people), as early as possible, through the provision of reliable and sufficient data including “who” is shipping “what” to “whom”, “when” and “by which means”, whilst streamlining the exchange of information with Customs/authorities and facilitating the flow of legitimate trade;

Resilience

- improve supply chain resilience (also to uncontrollable events) using risk management principles, contingency planning and enhanced real-time reaction capabilities;

Cost effectiveness

- deliver collateral benefits, especially higher cost effectiveness for transportation and supply chain systems to stakeholders (incl. SME) as an important factor for ensuring broad acceptance.

Solutions are expected to be tested in terms of practicability for commercial and logistics business, with a coherent ensemble of tests covering multiple modes of transport, actors and multiple categories of cargo, within a multi-layered approach. The potential for standardised application procedures, enhanced information sharing, and security audits, to be conducted jointly by appropriately designated competent agencies, should be evaluated.

For these reasons, the impact of the proposal will be assessed on its potential contribution (where appropriate) for:

- the testing and authoritative validation of technology / process integration (with a view to its future take up), on the basis of appropriate scenarios, including verification and detection capacity, as well as threat assessment and risk management,
- the proof of concept in the provision of timely and accurate data to whom (particularly customs, law enforcement authorities and business partners), and by when, it is needed in the supply chain,

- the proof of concept concerning the return of investment for private stakeholders and for availability of good quality data for public authorities (on global scale), opening novel options of robust security measures,
- the extension and cooperation for the sharing of good practices, opportunities for common certification practices, and contributions to the setting of international standards,
- interagency cooperation and coordination to achieve better integration of customs security procedures with other (border) security controls, in order to enhance security and efficiency at a lower cost for trade and public authorities,
- regulatory bodies to stay in tune with technology,
- the refinement and expansion of resiliency protocols within the WCO, IMO and ICAO, including the support to the development of guidelines, as applicable to the transport modes (air, land, sea) considered,
- driving standardisation in the application of supply chain security measures and supporting the creation of an EU and world-wide market for EU security methodologies and technologies,
- the proof of concept of a resilient supply chain from the business perspective, allowing companies operating in the EU to reduce risks and assessing positive impacts in business models,
- increasing security while maintaining or improving supply chain performance from the business perspective,
- seamless adoption and acceptance of the demonstration items by end-users including: authorities and public services (such as postal supply for packaging distribution), commercial companies, logistic services providers and shippers.

Topic SEC-2013.2.4-2 Non-military protection measures for merchant shipping against piracy – Capability Project or Coordination and Support Action (Coordinating Action)

Description of topic:

Piracy, a phenomenon widely thought to have been successfully eradicated in the 20th century, has as a consequence of failed states, managed to have an unprecedented revival lately. In key trade route choke points like the Gulf of Aden, it is threatening our trade fleets. Addressing the root causes of this phenomenon is a long term process having complex implications. In the mean time, short-term solutions are needed to protect merchant shipping. While dense EU and international military presence in the 'hot-zones' proves to be effective, the costs of such operations are high and naval assets spread thin. Alternative more cost-effective solutions to avoid, thwart or escape pirate assaults are needed. The main goal of this topic is to help protecting EU merchant fleets and maritime supply lines from criminal abduction and harassment. As "classical" approaches like convoys have proven to be ineffective and costly to deter modern pirates, other cost-effective means will have to be investigated. Therefore a thorough analysis of potential non-military counter-measures and approaches is needed based on hitherto best practices and experiences like:

- Comparison of experiences with “active non-lethal defence measures” versus “passive evasion measures”

Two general approaches for civilian ships countering actual piracy threats of becoming seized may be considered. Active non-lethal counter-measures (like water cannons, treated hulls to deny pirates attaching attack ladders or having ships accompanied by professional security guards) are effective but pose risks of escalating towards more violent tactics by pirates.

Passive evasion measures like higher cruising speed and evasive manoeuvre patterns reduce risks for the crew but increase costs and travel time and if they are the only method of defence they leave the vessel helpless in the case of the pirates successfully countering these efforts. Research would contribute to analyse the costs and benefits of both approaches may consider new solutions and potential combinations of both strategies for complementary advantages while estimating the costs and trade-offs emanating from such new solutions.

- Implications, legal pre-requisites and potential societal impact of using civil and/or private security companies to take over certain merchant protection tasks from the military

The use of civil and/or private security companies to protect Europe's fleet is source of heated debates. The issue of private security personnel under arms however remains controversial and hitherto legally opaque. The purpose of research work here is to investigate the possibilities, the legal limits/necessities and the level of societal acceptance for the potential use of such private companies to protect our civil/trade fleets. Conducted research should also determine ethically and socially acceptable technical measures to deal with piracy assaults especially on large ships and vessels without resorting to the use of lethal force.

In considering the wide array of ongoing actions in the field of countering pirate assaults it is essential to avoid the duplication of measures and the creation of isolated solutions. Therefore, an active involvement of the relevant European Commission services and EUNAVFOR is essential. Related research projects and actions on EU and national level like SECTRONIC and VESCOSUR and their respective activities/results should be taken into account as well in a successful proposal. An overview and analysis of ongoing non-EU non-military initiatives to counter pirate assaults should also be considered to accomplish the whole picture of existing counter-measures and trends in this field.

Funding schemes: Collaborative Project (small or medium-scale focused research project) or Coordination and Support Action (Coordinating Action)

Expected impact:

Relevant civil stakeholders / end-users should be provided with an exhaustive practical guide on active and passive contemporary measures to counter pirate threats and their legal, economic and societal implications. Advantages and disadvantages of these measures should be highlighted and realistic improvements proposed. The results should be presented in a well structured and functional way (e.g. in form of a manual) to aid in the usage and further development of counter piracy measures. An automated decision support tool can aid the operator with real time threat assessment and help him determine the best course of action in case of a threat. Such a tool could also provide training and planning capability. Thereby successful projects would provide important support for securing Europe's maritime supply lines and forcing back the resurgent scourge of piracy.

Area 10.2.5 Cyber crime

For this area of the work programme attention is being draw to related activities of the European Defence Agency (EDA). For further details see the website of EDA (www.eda.eu).

Topic SEC-2013.2.5-1 Developing a Cyber crime and cyber terrorism research agenda – Coordination and Support Action (Coordinating Action)

Description of topic:

The objective is to develop a research agenda which provides concrete answers to the following issues: In what categories can we subdivide Cyber crime and cyber terrorism? What are the major research gaps? What are the challenges that must be addressed? What approaches might be desirable? What needs to be in place for test and evaluation? To what extent can we test real solutions, etc.?

Funding schemes: Coordination and Support Action (Coordinating Action)

Expected impact:

The study outputs are expected to provide complementary guidelines on enhancing the surveillance of Cyber crime in order to ensure the security of citizens and of critical infrastructures against cyber threats.

Topic SEC-2013.2.5-2 Understanding the economic impacts of Cyber crime in non-ICT sectors across jurisdictions - Capability Project

Description of topic:

The aim is to measure and analyse the economic impact of Cyber crime on non-ICT sectors (i.e. transport, energy, finance, health etc) and analyse the criminal structures and economies behind such crimes.

Proposers should also create a taxonomy and an inventory on crime committed against non ICT sectors through the use of communication networks.

The research shall foster the understanding and the awareness of the non-ICT sectors and furthermore it should present effective measures for the management of risks related to Cyber crime. Research should develop concrete measures and methods to deter possible criminals and to drastically limit the attractiveness of such crimes.

It goes without saying that the European dimension, jurisdiction implications and interdependency on the involved domains shall be taken into account.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

The research shall increase the awareness of policy makers. It should increase the trust and confidence of EU citizens in using cyber applications. It should furthermore help businesses to provide crime-proofed applications.

Topic SEC-2013.2.5-3 Pan European detection and management of incidents/attacks on critical infrastructures in sectors other than the ICT sector (i.e. energy, transport, finance, etc) – Integration Project

Description of topic:

The objective is to improve the detection and management of highly sophisticated security incidents/attacks, including cyber attacks/incidents against critical infrastructures (i.e. transport, energy, finance, and water supply sectors) by enhancing a pan-European and shared situational awareness of vulnerabilities, threats and events. While multi-country/continent wide methods for managing cyber attacks on ICT assets in telecom networks exist today, arrangements for other critical infrastructures are less developed. The methodology and tools to be developed would aim to connect security operation centres at the level of Member States/Associated Countries and operators of such infrastructure, within a collaborative platform which would allow a pro-active protection and fast defence response across multiple domains in heterogeneous networks and systems.

The research shall aim at building the following capabilities: sharing of sensitive technical information collected nationally through secured exchange protocols, providing an adequate early warning system to identify incidents rapidly, coping with rapidly evolving constraints in a scalable and flexible way. The research should pay attention to aspects of usability, societal acceptance and economic and legal viability.

The research shall also include research into solutions and systems for managing, analysing and visualising large data streams or data sets from sensors in order to identify and assess threats. It shall also include research into technical, organisational and regulatory solutions to create a secure environment for the sharing and dissemination of information on threats with relevant public and private parties in order to facilitate preparation and response.

It will investigate how to promote adoption of good practices across sectors. The research shall include a stock taking of existing practices in terms of regulatory or voluntary reporting to competent authorities of security incidents/attacks.

The project should integrate all the capabilities developed or acquired in a coherent shared platform where authorised users could register and exchange meaningful information. A full scale demonstration of the platform is expected.

Many activities have already been undertaken to improve detection mechanisms and to facilitate collaboration in such domain. Related existing activities funded notably under the FP7 Security and ICT themes have to be taken into account. Existing regulatory framework should be taken into account (directive on critical infrastructure protection 2008/114 EC).

Funding schemes: Collaborative Project (large scale integrating project)

Expected impact:

Potential users of the expected developments will be various public and private entities, at national and European level (e.g. EUROPOL) of which active participation (e.g. security operation centres, public authorities and relevant EU agencies) should be sought for.

The action should be an opportunity for networking and exchange between the stakeholders to facilitate the emergence of common European standard.

This platform is seen as an essential step to develop secure collaborative detection and management networks environments for critical infrastructure sectors in Europe.

Topic SEC-2013.2.5-4 Protection systems for utility networks – Capability Project

Description of topic:

The objective is to categorise different types of utility networks (i.e. water, pipeline, gas, etc, that are loosely or not at all connected to telecommunication networks; but excluding telecommunication networks themselves) that can be considered as critical infrastructure.

The task is to develop processes and policies to prevent new threats trends (like for instance Advanced Persistent Threats - APT) targeted against Supervisory Control and Data Acquisition (SCADA) systems. A special attention should be given to the use of new ways of voluntary or involuntary transmissions through personally owned digital/communication devices used in business day to day life.

The research should also propose to include these particular threats in existing risk assessment methodologies.

Moreover global guidelines on enhancing the surveillance of these critical infrastructures should be assessed and also new innovative methodologies and technologies should be developed in order to minimise the cyber risks and threats to these systems.

The research output is therefore expected to provide a clear categorisation of critical infrastructures in terms of threat sensibilities versus the impact on the population

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

It is expected that the operators will gain a better understanding of risks against their own infrastructures and minimise cyber risks and threats through new and innovative technologies. It is also expected to increase the awareness of policy makers and to pave the way for new legislation if needed. It should also prepare standardisation activity in this area with a view to facilitate an EU market.

Activity 10.3 INTELLIGENT SURVEILLANCE AND BORDER SECURITY

Activities will deal with issues relevant to all the consecutive tiers of European border security strategy, starting with visa application procedures in embassies and consular posts (1st level), cross-border cooperation (2nd level), measures at the border crossing points at land borders, harbours and airports as well as between the border crossing points at green and blue borders (3rd level) and finally activities inside the European external borders (4th level) such as exchange of information, compensatory measures, Schengen Information System (SIS), Judicial and Police, Customs and Border Guard cooperation (PCB). A series of capabilities are required to cope with this mission area, many of which primarily relate to the phases "identify", "prevent" and "protect". The ambition is both to avoid an incident and to mitigate its potential consequences.

To build up the required capabilities, emphasis will be on issues such as: enhancing the effectiveness and efficiency of all security relevant systems, equipment, tools and processes used at border crossing points (e.g. identification of accessing people, non-invasive detection

of people and goods, tracking of substances, sampling, spatial recognition including data capture and analysis, etc.); improving the security of Europe's land and sea borders (e.g. through non invasive and underwater detection of vehicles, tracking of vehicles, spatial recognition including data capture and analysis, surveillance, remote operations, etc.); maritime security; assessment and management of (illegal) migration flows. A suitable framework will be established to coordinate with the activities of the European Agency for the Management of Operational Cooperation at the External Borders.

Area 10.3.1 Sea borders

No specific topic for this area has been planned for this call.

Area 10.3.2 Land borders

Topic SEC-2013.3.2-1 Pre-Operational Validation (POV) on land borders

Description of topic:

The Security Research Theme aims to promote further cooperation between public authorities (end-users) developing new solutions to improve the quality and efficiency of public services related to security on topics of common European interest, through the pre-operational validation (POV) of solutions related to such services. Pre-operational validation guided by potential end-users allows a tangible assessment of the performance levels offered by innovative technologies in a realistic user-defined operational scenario, where a trade off between efficiency, effectiveness and cost can be aligned with actual needs. Moreover, pre-operational validation allows not only the assessment of a stand-alone technology, but also the assessment of the integration into current surveillance infrastructure of the new capabilities provided.

The close link between end-users and industry, especially in those cases where there is a fuzzy perception of the real needs of the user for a particular technology in daily practice, is expected to extend the benefits of pre-operational validation beyond technical development. The identification of innovative applications, business models and procurement strategies is also expected to reverberate in the integration of innovative solutions as a fully operational tool. By acting as technologically knowledgeable validator of new R&D, the public demand side can drive innovation.

The validation of innovative solutions in real operational environments requires a notable effort by end-users at all levels, including technical, organisational, operational and budgetary. Keeping in mind the necessity to directly involve public bodies in charge of border surveillance, the Pre-Operational Validation (POV) concept has been chosen as a way to assess the performance levels offered by innovative technologies in a realistic end-user defined scenario, where a trade-off between efficiency, effectiveness and cost can be aligned with actual needs.

Last but not least, the activities carried out under POV make it possible to integrate and validate at the EU level, in an experimental framework, the achievements of previous initiatives that have explored and studied the different dimensions of components and systems, from their pure technological development to the features of their exploitation.

This topic is presented for proposals to enhance the use by the concerned civilian authorities of innovative technology for border surveillance.²⁴ The specific objective of this topic is to address solutions for the pre-operational validation of "*Common Application of Surveillance Tools at EU level*".

The overall objective is to provide the EU with an operational and technical framework that would increase situational awareness and improve the reaction capability of authorities surveying the external borders of the EU/Schengen area. Only selected elements of a European approach to Border Surveillance are to be done at European level, in line with the principle of Subsidiarity. A decentralised approach with national authorities is to be followed in implementation so as to:

- allow the highest possible level of integration with current surveillance systems and infrastructure,
- make use of the existing and future communication channels that facilitate the generation of a Europe wide situational picture and a full operational awareness at the external borders.

The EU Sea Border is currently sufficiently covered by ongoing FP7 activities. On the other hand there is a deficit of land border initiatives. POV research activities are proposed to be oriented to the validation of an adaptive and knowledge-aided multi-sensor infrastructure providing an integrated system.

Indeed, the EU/Schengen land border requires continuous day/night detection and assessment capabilities to provide early warning on unauthorised intrusion across the border by smugglers, irregular immigrants, or people involved in any other illegal activity. At official border crossing points (BCP) there is a continuous prevention and protection against these threats that may affect the security of the European Union. However, actual irregular border crossings are being increasingly performed on foot or with the help of light vehicles outside the BCPs, taking advantage of the terrain and of poor visibility to avoid detection. In remote areas of land borders, where it is relatively easy to irregularly trespass the frontier undetected, the cost of providing and maintaining effective physical barriers is excessive.

Technology has been a trustable ally, but current capability demand requires progress beyond the current state of the art. Tools and systems need to be aligned with current threats, overcoming existing limitations and provide cost-effective solutions in line with the end-users' needs. The evaluation of cost efficient platform/sensor combinations and of systems matching data exploitation is a research priority for Border Guard communities. A POV on land border surveillance should, hence, investigate and evaluate such technologies in live tests carried out under operational conditions defined by border surveillance authorities.

New security solutions to be validated under this action should take into account any aspect of border security that could threaten human rights or break international law. When necessary and appropriate, alternative solutions should be explored. Capabilities intended to provide "early warning" or "detect" observations from EU/Schengen neighbouring countries should be developed in agreement with neighbouring countries.

The topic is to be implemented via the CP-CSA funding instrument, which involves a combination of the collaborative project and coordination and support action funding

²⁴ The Commission indicated such objective in its communication "EU Internal Security Strategy in Action: Five steps towards a more secure Europe" (COM (2010) 673 final)).

schemes. It enables therefore the financing, under the same grant agreement, of research, coordination and support activities.

Its aim is both to enable public authorities in charge of border surveillance to innovate faster in the provision of their institutional services, making them more efficient and effective, and to increase the research capacity and innovation performance of European companies and research institutions, creating new opportunities to take international leadership in new markets.

This CP-CSA for POV will combine two components with synergistic effects:

- a. Networking and coordination activities: for public bodies in Europe to cooperate in the innovation of their public services through a strategy that includes POV.
- b. Joint research activities: related to validating the POV strategy jointly defined by the public bodies participating in the action. This would include the exploration of possible solutions for the targeted improvements in border surveillance services, and the testing of these solutions against a set of jointly defined concepts of operations and performance criteria.

The nature and the objectives of this indirect action are such that it should ideally involve at least three independent public authorities in charge of border surveillance (at local, regional, national or supra-national levels), each established in a different EU Member State or Associated Country. Other stakeholders may participate in addition, if their participation is well justified and adds value to the action, for example (but not limited to) if:

- a. they represent an authority or a regulatory body with responsibility in some area affected by the use of a particular technology,
- b. their support is required in order to facilitate the technical, administrative, financial or managerial procedures for which national authorities are limited by their respective national regulation.

SCOPE of the CP-CSA (Collaborative Project and Coordination and Support Action)

In the context of European Border Surveillance, this CP-CSA is to conduct pre-operational validation of common applications of tools for the surveillance of land borders at EU level via the competitive testing and assessment of potential solutions. Tools to be tested may include a variety of platform types deploying sensors for surveillance purposes.

The information acquired by each platform type should be correlated with other available intelligence sources (i.e. airborne or satellite imagery, sensor data or open source information) to provide the relevant national and European Agencies with surveillance information on their external borders and the EU pre-frontier area on a frequent, reliable and cost-efficient basis.

The specific objective of the competitive testing will be to assess:

- the demonstration that there are existing innovative solutions which provide the required additional capabilities;
- the identification of technological solutions for the achievement of a set of user-defined operational objectives;

- the technical feasibility of options for the Common Applications of different types of surveillance tools;
- the feasibility of the integration of these technologies taking into consideration the limitations imposed by the existing surveillance deployments;
- the comparative performance of proposed options, while deployed in daily operations in real scenarios;
- the identification and documentation, as appropriate, of the infrastructure, capabilities and skills required for the acquisition and operation of these systems under user-defined safety and security conditions;
- the cost-benefit ratio of each of the options tested;
- the identification of the maturity level showed by solutions in order to promote short/mid-term utilisation;
- the definition of innovative applications, business models and procurement schemes that can facilitate the migration to these new solutions from the existing traditional tools;
- the evaluation of the experimentation results promoting their widening to future solutions.

As part of the project activities, the industry shall be called to provide solutions to be tested and validated according to the concept developed by the consortium participants. In order to guarantee an independent and reliable validation process of the proposed solutions, a mechanism has to be enabled that supports the activity of the different actors throughout a series of steps.

The overall validation action **CP-CSA** is to be divided in the following three phases.

1) Initial Definition Phase (CSA):

The definition phase should be based on the latest relevant requirements for European Border Surveillance. Participating border surveillance authorities are expected to present their cooperative plan for definition of the later phases, in coordination with other relevant EU organisations (if appropriate).

In this phase a strategy shall be put in place for:

- identification of elements requiring new R&D that could be tested and validated in cooperation,
- definition of an action plan, setting scenarios and issues for concrete implementation of activities,
- establishment of good practice procedures for POV evaluation and monitoring (common evaluation criteria and implementation methods),
- drafting a preliminary IPR strategy for the (expected) outcome of the Call for Tender in phase 2, taking into account the provisions set out in the Appendix,
- allocation and training of additional resources for implementation (if appropriate),
- building cooperation with other stakeholders (if appropriate).

The outcome is expected to be a Needs Analysis Document and a Validation Strategy Document, including a practical Exercise Plan for the actual testing phase, to be used for the definition of the specifications of a joint POV Call for Tender for the subsequent execution phase, setting the rules for participation, the criteria to evaluate competitive tenders, and for selection/award of the tender. Such call shall be defined in such a way that it respects the Treaty principles and the specific requirements in Appendix.

2) Preparatory Work and Execution Phase (CP):

This phase will implement the strategy and action plan as prescribed by the participating authorities, in Phase 1 (in particular the Call for Tender for the implementation of testing).

In this phase the providers of solutions to be tested will execute the testing of their systems according to the prescription of the action plan, working under the supervision of the concerned national Border Authorities.

3) Final Ex-post Assessment Phase (CSA):

In this phase, which will conclude the overall validation, participating national Border Authorities, in coordination with other relevant EU organizations, will conduct a thorough assessment of the solution performances as demonstrated in the testing exercises of phase 2, against the set of jointly defined performance criteria, in order to verify fitness for purpose, with a view to a potential conversion into permanent services of the systems tested. This phase should confirm as appropriate the IPR strategy and include dissemination of results to standardisation bodies (if appropriate).

For implementing this CP-CSA, different constellations for joint validation²⁵ are allowed, such as for example common validation entity²⁶, lead authority²⁷ and piggy-backing²⁸ constellations.

EU CONTRIBUTION

The EU contribution shall take the form of a grant that will combine the reimbursement of:

- 100% of the total eligible costs (the reimbursement of the indirect cost may reach a maximum of 7% of the direct eligible cost) of the participating authorities for the activities linked to the preparation, definition, management and coordination of the joint POV Call for Tender (CSA phase 1),
- maximum 50% of the total eligible costs for the research and technological development activities charged by the providers of solutions to be tested (75% in case of "*Market failure and of accelerated equipment development*"²⁹) (CP phase 2) and

²⁵ "Joint validation" means combining the validation actions of two or more contracting authorities. The key defining characteristic is that there should be only one tender published on behalf of all participating authorities.

²⁶ The "common validation entity" constellation is an arrangement for joint validation where all involved public authorities commonly establish or designate one external legal entity to conduct the joint validation with a joint mandate and joint resources of all public purchasing authorities. This entity shall be integrated among the project beneficiaries in equivalent conditions in terms of rights and obligations, and support the decision process, facilitating the development of a validation strategy and the arrangements for launching a competitive call for the demonstration of surveillance capabilities.

²⁷ The "lead authority" constellation is an arrangement for joint validation where a group of public authorities collaborate through their existing departments in such a way that one public authority of the group is designated as lead authority to take responsibility for, tendering and arranging contractual documentation for specific validations, all in consultation with other purchasing authorities involved in the joint validation.

²⁸ In the "piggy-backing" constellation one public authority executes the validation and provides access to the results of the contract for a wider range of authorities, essentially by stating in the Contract Notice that other named public authorities may also wish to make use of the resulting contract a later date (normally during the timeframe of the original contract).

- 100% of the total eligible costs (the reimbursement of the indirect cost may reach a maximum of 7% of the direct eligible cost) of the participating authorities for the activities linked to the final validation of the outcome of the execution phase (CSA phase 3).

It is clear from the above that, in addition to the EU financial support to phase 2, participants shall contribute directly to the research and technological development activities involved in the testing of new solutions. This contribution of the participants to phase 2 can be in kind (e.g. personnel, premises, systems and services).

Expected impact:

This CSA-CP is expected to significantly contribute to the implementation of an EU approach to Border Surveillance, thus enabling national and other relevant authorities to more effectively carry out their border surveillance activities, collaborating at tactical, operational and strategic levels, in order to:

- increase internal security of the EU by preventing cross-border crime; and
- reduce the number of irregular migrants across the external EU borders.

At the end of the project, the participating public bodies in charge of border surveillance (also potential purchasers) should have obtained clear evidence of the cost-efficiency of (alternative) surveillance systems, which could later be deployed as common EU level surveillance applications.

The project is also expected to promote increased opportunities for market uptake and economies of scale for the supply side by forming critical mass on the public demand side, and contribute to standardisation of jointly defined public sector requirements specifications.

Through the execution of the project, the adaptation of existing technologies and the research and development of new technologies, participants are expected to verify and optimise their technological choices. Technology providers will increase their understanding of modern operational requirements thus increasing their competitiveness. The project has the potential to create important market opportunities for European industry and establish a clear leadership in this area.

Appendix: Specific Requirements for the implementation of Pre-Operational Validation (POV)

The following requirements are applicable to POV calls for tender launched under actions requiring POV to ensure that the conditions for the Article 16(f) exemption of the public procurement Directives 2004/18 and Article 13(j) of Directive 2009/81/EC are respected, that the risk-benefit sharing in POV takes place according to market conditions and that the Treaty principles³⁰ are fully respected throughout the POV process:

²⁹ Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013) Art 33.1

³⁰ In particular the fundamental Treaty principles on the free movement of goods, the free movement of workers, the freedom to provide services, the freedom of establishment and the free movement of capital, as well as the principles deriving there from, such as the principles of non-discrimination, transparency and equal treatment.

- The consortium of public bodies should verify that the topic proposed for the joint POV call for tender would **fit the scope of an R&D³¹ services contract³²**.
- More than 75% of the EU contribution is expected to fund Phase 2 (Preparatory Work and Execution Phase).
- **The practical set-up foreseen for the POV** shall be clearly announced in the POV contract notice. This shall include the intention to select multiple companies to start the pre-operational validation in parallel, as well as the number of phases and the expected duration of each phase.
- **Functional specifications** shall be used in order to formulate the object of the POV tender as a problem to be solved without prescribing a specific solution approach to be followed.
- In view of triggering tenderers to send in innovative offers that include R&D that can bring breakthrough improvements to the quality and efficiency of public services, the selection of offers shall not be based on lowest price only. The POV contracts shall be awarded to the tenders offering **best value for money**, that is to say, to the tender offering the best price-quality ratio, while taking care to avoid any conflict of interests³³.
- In respect of the Treaty principles the public purchasers shall ensure **EU wide publication** for the POV call for tender³⁴ in at least English and shall evaluate all offers according to the same objective criteria regardless of the geographic location of company head offices, company size or governance structure.
- In POV, the public validator does not reserve the R&D results exclusively for its own use. To ensure that such an arrangement is beneficial both for the public purchaser and for the companies involved in POV, **R&D risks and benefits are shared** between them in such a way that both parties have an incentive to pursue wide commercialisation and take up of the new solutions. Therefore, for POV, ownership rights of **IPRs** generated by a company during the POV contract should be assigned to that company. The public authorities directly contributing to the POV phase (2), and the institutions of the European Union, should be assigned a free licence to use the R&D results for internal use, as well as the right to require participating companies to license IPRs to third parties under fair and reasonable market conditions, to be specified in the Call for Tender. A call-back provision should ensure that IPRs from companies that do not succeed to exploit the IPRs themselves within a given period after the POV project return back to the public bodies in charge of border surveillance.
- In order to enable the public validators to **establish the correct (best value for money) market price for the R&D service, in which case the presence of State aid can in principle be excluded** according to the definition contained in Article 107 of the Treaty on the Functioning of the European Union, the distribution of rights and obligations between public validators and companies participating in the POV, including the

³¹ R&D can cover activities such as solution exploration and design, prototyping, up to the original development of a limited volume of first products or services in the form of a test series. Original development of a first product or service may include limited production or supply in order to incorporate the results of field testing and to demonstrate that the product or service is suitable for production or supply in quantity to acceptable quality standards. R&D does not include commercial development activities such as quantity production, supply to establish commercial viability or to recover R&D costs, integration, customisation, incremental adaptations and improvements to existing products or processes.

³² Contracts providing more than only services are still considered a public service contract if the value of the services exceeds that of the products covered by the contract.

³³ For more info refer to Staff Working Document on PCP: SEC (1668) 2007.

³⁴ Through the Official Journal of the European Union (OJEU), using the TED (Tenders Electronic Daily) web portal.

allocation of IPRs, shall be published upfront in the POV call for tender documents. The POV call for tender shall be carried out in a competitive and transparent way in line with the Treaty principles which leads to a price according to market conditions, and does not involve any indication of manipulation. The consortium of public purchasers should ensure that the POV contracts with participating companies contain a financial compensation according to market conditions³⁵ compared to exclusive development price for assigning IPR ownership rights to participating companies, in order for the POV call for tender not to involve State aid.

- The POV contract that will be concluded with each selected organisation shall take the form of **one single framework contract covering all the POV phases**, in which the distribution of rights and obligations of the parties is published upfront in the tender documents and which does not involve contract renegotiations on rights and obligations taking place after the choice of participating organisations. This framework contract shall contain an agreement on the future procedure for implementing the different phases (through specific contracts), including, if appropriate, the format of the intermediate evaluations after the solution design and prototype development stages that progressively select organisations with the best competing solutions.

Topic SEC-2013.3.2-2 Sensor technology for under foliage detection – Integration Project

Description of topic:

Several regions at the EU/Schengen Area land borders have forests. The aim of the topic is to detect, locate, track and recognise persons and vehicles entering EU/Schengen territory irregularly in a forested region.

Surveillance in land borders implies observation over wide distances and harsh unstructured environments. This makes it very difficult for sensors (i.e.) radars to detect hidden objects (both mobile and static). The project should develop a system improving capabilities in operational use for situation awareness and identification of objects and groups of persons of interest (e.g. detection of abnormal behaviour, ability to interoperate with law enforcement bodies in case of incident).

Five complementary technology solutions are proposed for possible inclusion (not necessarily all five) into an integrated system, to be possibly implemented on airborne platforms and/or on ground based towers, so that each technology would be used for what it is best suited, taking advantage of complementarity of the elements:

a) Low frequency radars (UHF-VHF, from 80 MHz up to 400 MHz): They allow rapid scanning of large areas in all weather and lighting conditions, but the challenge is to distinguish the signal of persons and vehicles from the clutter due to variable vegetation and ground reflections and, even more, to detect and recognise targets when they are hidden beneath the vegetation. The technological challenges include better knowledge of natural background clutter and its dependence on environmental conditions; synthetic aperture radar techniques to improve spatial resolution to reduce clutter, polarimetric analysis to better distinguish man-made objects from natural background and a cognitive capability allowing

³⁵ The financial compensation compared to exclusive development cost should reflect the market value of the benefits received and the risks assumed by the participating company. In case of IPR sharing in POV, the market price of the benefits should reflect the commercialisation opportunities opened up by the IPRs to the company, the associated risks assumed by the company comprise for instance the cost carried by the company for maintaining the IPRs and commercialising the products.

dynamic optimization of sensor performance and adaptability to the environment. The analysis of the penetration of vegetation in different conditions as a function of frequency should be done as well, in order to design the best waveforms and systems to be used for foliage penetration. Specific development of wide band transceivers and receptors for increasing the precision of localization and tracking will also be needed; and this may require algorithms for detection, location, tracking, and identification.

b) Hyperspectral imagers: This imaging technique provides wide area surveillance with high resolution and improved capability to detect and identify targets and their traces in complex background through the detailed analysis of target reflection properties. Technical challenges include development of both hardware and software data processing for automatic target detection. If unmanned aerial systems were to be considered, data reduction techniques would need to be developed to enable both fast information and extraction from large hyperspectral data stream and effective transmission to a ground station.

c) Active or passive imaging systems: Laser pulse illumination can be used in all lighting conditions, combined with range-gating technology in order to see through vegetation, camouflage and windows. Active imaging can be applied to detection of persons and vehicles, but because of high resolution, the technique is particularly suited for eliminating false alarms of other sensors and for giving information of the target type (person, type of vehicle etc.). Broadband lasers allow detailed analysis of the reflection properties of a target and improve recognition capability. In this case technological challenges include further development of lasers and sensors, signal processing and new active imaging concepts like synthetic aperture Lidar, multi-aperture systems, photon counting imaging, holographic imaging and vibrometry for target identification.

d) Unattended Ground Sensors: The Unattended Ground Sensors provides a unified and distributed wireless and self-powered sensing network that can be adapted to any environment. The system can use different sensing technologies as seismic, magnetic, volumetric and video, in order to detect intruders in different scenarios, as roads, forest, rivers crossing... The technological challenge is the combination of processing technologies at sensor level to provide local target classification, and at system level to get alarm verification and tracking of the intruders. The communication of the sensors will be reduced to VHF to provide long range communications in forest environments.

e) High-resolution low-cost time-of-flight 3D camera: The ladars or lidar cameras are used for measuring absolute distance by the time-of-flight technique (ToF). It is based on calculating the travel time of a light pulse to obtain the direct measures of distance. This technique offers some outstanding qualities such as the ability to perform non-contact measurements of fast optically visible objects at distances from few centimeters to tens of kilometers. The precision of the measurement is around few centimeters. Some of the most important parameters are the precision, measurement time, range and spatial resolution. A substantial advantage over similar techniques such as stereovision regards on the result of the measurement process is directly the distance value, thus saving the need to run complex algorithms for 3D reconstruction. Also, the devices can work in noisy environments such as low light scenes, rainy or dense vegetation spaces generating three dimensional images from the measurement of many points forming dense point clouds with spatial resolution in the order of 2Mpx.

The integrated system implies the fusion of data generated by the different (distributed) sensors, thus an appropriate telecommunication element should be put in place for the management of this data exchange.

The solution should be capable of detecting man made activities with abnormal characteristics (as appropriate), thus the system should be defined in close collaboration with end users (border guards), on the basis of a clear analysis and understanding of their requirements (e.g. performances and affordability), with a view to allow them to plan resources more efficiently (e.g. by using an expert resource management system).

The inclusion of cognitive capabilities is expected to be of help for the improvement of performances (e.g. for automatic classification of the intrusions, the implementation of a unified tracking of the intruder, automatic image verification, reduction of the false alarm ratio).

Following a proper analysis of the technologies to be separately developed for system implementation, the ultimate objective of the project would be to assess performances at the system level in terms of capabilities.

Because much experience has been gained by the defence sector in this area, close cooperation should be sought in order to avoid any duplication of funding.

Legal, ethical and societal implications have to be taken into account appropriately.

Funding schemes: Collaborative Project (large scale integrating project)

Expected impact:

Impact would be benchmarked in terms of the expected improvement of border surveillance and effective management of incidents. The system should thus be tested and validated in terms of capabilities to:

- control effectively the land border, also where covered by a vegetation layer, enabling better situation awareness. The system should make it possible to more effectively detect and support reaction to (irregular) cross border activities, through the tracking of the intruder and the implementation of early warning strategies (with low rate of false alarm);
- plan more efficiently the use of law enforcing manpower to intercept people irregularly crossing the border.

End-users are expected to validate via real life demonstrations the fitness for purpose of the system, in terms of practicability and cost effectiveness.

The impact of the proposal is also to be measured in terms of potential for marketing opportunities for the EU industry, thus the proposal should present a credible and realistic analysis of such targeted market (worldwide).

Topic SEC-2013.3.2-3 Mobile equipment at the land border crossing points – Capability Project

Description of topic:

A major challenge for border authorities is the need to promote both security and mobility. Travellers require fast and convenient border crossings, whereas the authorities need to secure the EU/Schengen area from border security threats.

Currently, border security efforts focus mainly on airports, where automated border checks (ABC) are cost-efficient. At land border crossing points ABC's are, however, more problematic as they require large infrastructure investments if passengers need to park their cars, and enter the building where the ABC gate is installed. Increasing passenger flows would then require investments on new technologies, buildings etc.

Projects should aim at delivering border authorities more efficient technological equipment that provides higher security level of passenger identity control inside vehicles including in trains, at land border crossing points. What is in particular needed is mobile equipment together with fast and reliable wireless connection that can be used in checking passengers inside vehicles for biometric identification (for VIS and other large scale systems).

Legal, ethical or social implications have to be taken into account appropriately.

Proposers for this topic should look for an enhanced SME participation as described in Part 1 of the work programme.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

Visa freedom between the Schengen area and neighbouring countries (e.g. Russia) has been discussed for several years. Because visa freedom will increase the flow of people across the EU land border, fast processing is required for passengers within vehicles. Mobile equipment is expected to enhance the security and efficiency of land border crossing-points through the application of biometric technology for identity checks, enabling modern risk analysis of the passenger flows, and guaranteeing the efficient management of the increasing passenger flows. Legal, ethical and societal implications shall be appropriately taken into account.

Area 10.3.3 Air borders

No specific topic for this area has been planned for this call.

Area 10.3.4 Border checks

Topic SEC-2013.3.4-1 Border checkpoints - hidden human detection – Capability Project

Description of topic:

Technology for the easy, fast and effective detection of humans hidden in a variety of vehicles (cars, trucks, containers, buses, trains etc.) is still not available to border guard services. CO₂, heartbeat and x-ray detectors are all of limited effectiveness. It is highly important to continue to seek new and improved technologies that achieve close to 100% success rates while providing safety, speed and value for money.

At present, profiling and detection dogs have proven to be the most effective methods to detect humans hidden in vehicles. Such methods are labour-intensive. Therefore vehicles and containers are not systematically checked for hidden persons.

Technology currently used for detecting humans hidden in vehicles at border crossing points or in in-land mobile checkpoints is either too expensive or potentially problematic from a health and safety perspective, unreliable, or difficult to deploy in all border control scenarios.

The aim of this research project is to identify and develop a technology that can detect persons hidden in vehicles/closed compartments with the following characteristics:

- fully automated;
- contactless;
- reliable, with acceptable error/false positive rates (best minimum in comparison to dogs/manual searches);
- robust and resistant to different environments and weather conditions;
- suitable for all types of vehicles and containers;
- fast;
- high throughput;
- cost efficient (acquisition and running costs, staffing requirements);
- compliant with European health and safety regulations; and
- can be integrated with other technologies to detect dangerous/illicit materials (ideally in a one-for-all gate through which all vehicles/containers are automatically screened).

Such technology is to be deployed in stationary and mobile (portable, easily deployable) environments (at land and sea borders, for in-land checks).

As in this area an R&D FP7 cooperative project based on detection of human perspirations is already planned, alternative approaches should be envisaged.

The project should include at least the active participation of one authority officially in charge of border control at the national level.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

Today it is difficult to determine how many irregular migrants use successfully this modus operandi to cross the Schengen borders and arrive to their final destination. The identification of the entry-point into the EU of an irregular immigrant is an essential requirement for the juridical treatment of the case.

Impact will be assessed against the fitness for purpose of the developed technologies. Validation should thus be at the heart of the project and should be foreseen in the proposal taking fully into account the responsibilities of the national border control authorities (and the Frontex agency). Border authorities shall be closely involved in the project and the validation strategy should be put in place at the start of the project under their supervision. Validating authorities should be given the power to stop the project (at any stage) were they to consider developments not sufficiently promising.

In addition, as current practices in the Member States/Associated Countries include the use of a combination of technologies, border guards and customs authorities often share equipments

and cooperate very closely. The impact of the project should be also measured in terms of its interoperability potential. Legal, ethical or societal implications shall be appropriately taken into account.

Topic SEC-2013.3.4-2 Extended border security - passport breeder document security – Coordination and Support Action (Supporting Action)

Description of topic:

A recent study by Frontex on the Operational and Technical security of E-passports³⁶ identified that the reliability of the e-passport issuance process is vital for EU/Schengen border control. Indeed, since every Member State has in essence the role of a “back-door” into its Schengen neighbours, it is important to ensure that each external border maintains a minimum equivalent level of security and that variations in the e-Passport issuance process are minimised.

If legitimate documents are being issued on the basis of unreliable ones, then border control cannot address this problem. The Frontex report therefore recommended that “structural information exchange between the issuance community and the border control community on e-passport security matters” and that “training (and possibly tool provisioning) for the verification of breeder documents by issuance officers” be provided.

The proposal should investigate:

- the current state of passport breeder document requirements and issuing practice in Member States/Associated Countries;
- identify key common security gaps;
- recommend possible solutions; and
- include feasible and cost-effective training and communication methods.

Funding schemes: Coordination and Support Action (Supporting Action)

Expected impact:

The impact of the project will be assessed in terms of:

- its potential to contribute (credibly and substantially) to the improvement of the reliability of the process of e-passport issuance, redressing security gaps, and its harmonization at the EU/Schengen level;
- the value of its outputs for intensified training of both passport issuance officers, on how to detect falsified breeder documents (such as birth certificates), and of border guards, on the specifics of e-Passports inspection.

Topic SEC-2013.3.4-3 Security checks versus risk at borders – Capability Project

Description of topic:

Current EU and national policy in the vast majority of EU/Schengen Member States prescribes 100%, or close to it, checks on passengers. A great deal of resources (human and financial) is spent on such activity both by the public and private sector. Technological policy approaches have been taken for improving the efficiency of such checks, even to the extent of prescribing which system and equipment should be used by border crossing points (BCPs) –

³⁶http://www.frontex.europa.eu/gfx/frontex/files/frontex_study_on_operational_and_technical_security_of_electronic_pasports_public.pdf

irrespective of the threat level or numbers faced but always on the basis that 100% checks give the greatest benefit in security terms in relation to their cost in resource and speed of passage terms. However, there is little questioning of the fundamental correctness of this approach and very little empirical work that would allow policymakers to decide if a more targeted approach would give similar or better security results.

In this topic researchers are expected to:

- “red team” security measures in a number of BCPs of the 3 types across Europe (air, land and sea) facing different numbers of passengers and levels of threat,
- assess the global impact of the different schemes of security checks, including the costs at the user’s level,
- assess whether 100% checks are effectively the best way to guarantee security, based on different experimental set ups of security measures,
- assess vulnerability in human, organizational and technical resources comprising the security system,
- suggest an approach for security checks based on threat levels and a dynamic evaluation of risks at individual level, instead of the current scheme,
- propose a (or various) solution(s), based on existing or under development technologies, to implement this approach,
- evaluate the potential areas where additional research should be carried for such an implementation,
- pay a special attention to guarantying the protection of fundamental rights and especially of personal data protection in the proposed solution(s).

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

Available operational research, for example in airport security, suggests that no system can be completely secure, that benefits drop off rapidly after a certain level of cost and that random checks may well be as effective, or sometimes more so than 100% checks. Moreover, systems and equipment used to create security levels are public and well-known to all potential wrongdoers, thus counteracting one of the most important elements of an effective security measure (the fact that what it is and how it works are unknown to the potential attackers). Authorities also make the point that the best guarantee of security is the overall individual risk-based assessment, and not only the mere carriage of dangerous or prohibited items.

The research is expected to provide an analysis of security levels in 3 types of BCP (air, land and sea) and to propose a detailed approach of border checks based on individual risk evaluation. A credible strategy should be presented for the appropriate communication of the results for the future decision making process.

Area 10.3.5 Intelligent border surveillance

No specific topic for this area has been planned for this call.

Activity 10.4 RESTORING SECURITY AND SAFETY IN CASE OF CRISIS

Activities will focus on technologies providing an overview of, and support for diverse emergency management operations, such as in civil protection (including natural disasters and industrial accidents), humanitarian aid and rescue tasks. A series of capabilities are required to cope with this mission area, many of which primarily relate to the phases "prepare", "respond" and "recover". The ambition is to mitigate the consequences of the incident. To build up the required capabilities, emphasis will be on issues such as: general organisational and operational preparedness to cope with security incidents (e.g. inter-organisational coordination and emergency communication, assessment of strategic reserves, strategic inventories, etc.), crisis management (e.g. integrated means of alert and management, assessment of the incident and priority requirements, integration of heterogeneous actors and resources, evacuation and isolation, neutralisation and containment of effects of terrorist attacks and crime, etc.), intervention in hostile environment, emergency humanitarian aid and the management of the consequences and cascading effects of a security incident (e.g. the functioning of the public health care system, business continuity, confidence building measures, restoring the disrupted or destroyed functioning of society, etc.).

Area 10.4.1 Preparedness, prevention, mitigation and planning

Topic SEC-2013.4.1-1 Phase II demonstration programme on aftermath crisis management

Description of topic:

It is largely recognised that emergency and crisis situations³⁷ will become more complex, uncertain and unpredictable. Vulnerability of the societies in Europe is inevitably increasing. Whenever and wherever they happen, crisis situations usually deserve a scalable (regional, national, European, International) and multi-faceted approach as they tend to provoke severe and unexpected human suffering, physical, psychological, societal, environmental, economical and political effects that might also easily cross the borders inside as well as outside the EU.

This FP7 Security Research demonstration (the "*demo*") should develop comprehensive solutions and approaches (e.g. a "system of systems" or a "large comprehensive toolbox") that will contribute to enhance the resilience of the EU societies against future crises, by providing EU-tailored preparedness and response solutions able to allow enhanced performance and interoperability between relevant actors in all its dimensions. It could for example provide a test-bed to promote assessment and acceptance of these solutions and approaches. The aim is not to create a fully new system replacing existing ones; but rather to integrate it into existing systems and projects at local, regional, national and EU level, with a scalable approach to adjust to large scale disasters and evolving situations.

The project should also develop guidelines and tools for the creation of disaster databases and the compilation of reliable, interoperable disaster occurrence and impact data within the European Union.

Since lack of reliable and real time information is one of the main problems in disaster management, current monitoring networks could be coupled with ad hoc technologies (ground

³⁷ As for example fires, floods, earthquakes, pandemics, weather casualties or environmental contaminations

based , airborne and satellite based) in order to provide a quick damage assessment, which is the starting point for any kind of decision and intervention.

The implementation of this crisis demonstration programme is clearly expected to link policy, research, industry and end-users in order to make it realistic, reliable and useful at the end. It should bridge the current gaps and allow testing and (pre-operational) validation of research solutions that at a later stage could be applied directly for disaster management. The demo should increase our capacity to anticipate and prepare for disasters, inter alia through better monitoring and planning, including an improved use of existing assets and logistics. It should also increase our capacity to respond to disasters.

Coordination is crucial during large scale disasters due to the involvement of a large number of actors and the uncertainty and lack of information that characterise a major crisis. In order to prepare solutions for an improved coordination, the demo should identify and take into account comprehensive and representative scenarios that will trigger as many aspects of the different crisis situations as possible, involving the tactical, operational and strategic level.

The population is always a key actor in crises and disasters, both as the affected and as the very first source of response, both independently and as volunteers in support of professional response organisations. Enhancing the disaster resilience of EU societies means first and foremost preparing the population, thus a strong citizen focus should be an important driver of the demo. In this sense, social networks and their particularities in terms of communications could be taken into account, in particular in the way they can be used for crisis management and post-crisis activities.

Cost-efficiency should be introduced in all aspects of the crisis management activities. As such the demo should include it as a key factor (best use of available resources). In particular, the costs of coordination activities and logistics should be addressed with special care, reinforcing mutual confidence with a rationalisation of end-users' resources.

The demo should present a "next generation" approach to the problems targeted and solutions offered, demonstrating a clear innovative approach, going beyond activities already conducted within the EU.

Link to EU policies

The demo should correspond to EU policy priorities in the area of crisis and disaster management³⁸, where serious, unexpected and often dangerous situations require immediate action; situations that may affect the lives, infrastructures, the environment or the basic values of EU society.

The demo should in particular contribute to the general orientations³⁹ for future EU Civil Protection (EUCP) which have been set out in the Commission 2010 Communication '*Towards a stronger European disaster response: the role of civil protection and humanitarian assistance*' and the recent EC legislative proposal for a revised EU Civil Protection mechanism. As addressed therein, there is a need for enhanced prevention and preparedness since this can reduce the potential impact of many disasters.

³⁸ Including for instance the Floods Directive(2007/60/EC).

³⁹ Such measures include for example the development of national risk management plans, the development of contingency planning for EUCP operations and the creation of a voluntary pool of national assets.

There is a need for stronger links between all phases of the disaster management cycle and the demo should strengthen these links.

Contribution of ongoing research and lessons learned from other fields and past incidents

A large set of projects⁴⁰ related to crisis and disaster management have been completed or launched in recent years within the EU. In addition to this, national-level experiences have also been built and evaluated in this field, providing a wide range of findings which should be taken into account in the demonstration. The demo should therefore build on existing tools and results of completed and ongoing projects, and combining them with legacy systems and tools. The demo should provide a strong contribution to existing structures and financial instruments (EU and national levels).

Knowledge and experience from other fields such as health, environment, transport etc. could be useful and could be brought into the demo if relevant.

Lessons learned from past incidents, preparedness activities and simulations should also pave the way for future actions since lessons learnt are key in improving the system

Integration, testing, validation, field demonstrations

Integration of promising approaches and solutions into existing systems and mechanisms, as well as interoperability between existing technology and its users is essential and should be considered in the demo.

Proposed solutions and technologies, in order to be applicable, have to be accepted and validated by the end-users and finally incorporated into their Standard Operating Procedures. The demo project therefore has to address the way the end-users are processing data and utilising technology in crisis situations.

The demo should only consider mature and near mature approaches that can be brought to operation within the time frame of the project. To date there has been limited (pre-operational) system validation in FP7 crisis management related projects. The demo should therefore put emphasis on testing, validation and iterative improvement of research solutions (including pre-operational validation).

The demo could provide a test bed for testing and evaluating tools, operational concepts and approaches with an active participation of operational end-users. Such a test-bed could include (methods for evaluation and performance assessment, experiment support tools, and if justified, modelling and simulation in support of testing and evaluation).

These end-users and their respective authorities are those in the best position to define and assess the performance of the tools and solutions developed. These should be experimented in a pre-operational configuration, to be defined by representative stakeholders in different Member States and/or FP7 Associated Countries.

Involvement of end-users and stakeholders

Involvement of crisis and disaster end-users and stakeholders in FP7 and in a demo is challenging but it can substantially influence research outcomes through:

- transfer of practical know-how from experts to scientists;
- conducting of (testing) exercises, training and practical support; and

⁴⁰ Mainly FP7 Security Research but not exclusively

- ensuring the acceptance and usability of the suggested solutions, through extensive processes of consultation with those who are to use / be assisted by the suggested tools.

End-users and other stakeholders should bring their expertise, needs and past experiences into the demo, at all levels, including their already existing demo infrastructure and tools.

The involvement of end-users and stakeholders is therefore expected during all phases of the demo:

- during the definition and preparation of the proposal, with practical questions;
- during the design of the actual work, with practical questions;
- during the R&D with experts feedbacks to the researchers and developers; and
- during the end-phase with testing, validation exercises, user feedback.

End-users and stakeholders should be representative of all levels of crisis and emergency management actors, including local, regional, national and international agencies, including public and private entities.

EU added value and the EU dimensions of crisis management

In this demo the focus should be on the internal EU cross border dimension, aiming at meeting the EU internal challenges for Civil Protection and crisis management (interoperability, host nation support, SOPs, organisational structures etc.). There might, however, also be a need to address external crises which directly affect the EU internal security (e.g. pandemics, energy supply, and volcanic eruptions) or which can bring a clear EU added value to the demo (for example like strengthening the EU's visibility in global crisis management). Working on the internal and external dimension is not mutually exclusive, but they may indeed require a distinct approach.

Scenarios and locations for crisis demonstrations activities:

In order to demonstrate their value and potential for future disaster management, the solutions and results will be assessed, tested and validated in joint regional, national and large scale, cross border scenarios under realistic and real time conditions according to a list of selected predefined representative crisis scenarios (a minimum of 3 is expected). These "demonstration" operations should be organised in locations offering a clear cross border dimension and/or EU added value. To allow for optimal cost-effectiveness, the use of modelling and simulation for testing and evaluation could be used to complement live demonstrations, but only if justified.

The definition, preparation and coordination of, as well as lessons learnt from these activities should closely involve local and/or national and/or EU crisis and disaster end users and authorities.

Measurements and indicators of achievement

As an essential part of the demonstration activity, clear, measurable, qualitative and quantitative indicators (and any other reliable evidence) should be presented, such as:

- EU added value;
- usefulness and achievements (including potential for future applications and operations);
- scalability and modularity;
- reliability;

- innovation; and
- affordability and cost-effectiveness (best value for money).

These indicators will be used to demonstrate the level of achievements and success reached in the demo, as well as the potential for future applications and operations

Funding schemes: Collaborative Project (large scale integrating project)

Expected impact:

It is impossible to foresee all potential disasters and their effects. Therefore, the demo is expected to provide solutions (either generic tools or a coordinated portfolio of tools) that can be used on a daily basis by end-users, but that are also scalable in a crisis and adaptable to different crisis situations as well as changing conditions during the disaster. The demo will provide an integrated framework bringing together the abilities of industry, research institutions, operational end-users and the citizens, to jointly progress in the critical areas of crisis management and to create acceptance for new solutions and approaches. It will therefore help crisis management systems and cross border concepts to adapt to new and changing threats and to the use of new tools.

On preparedness, the demo will integrate the development of methodologies and demonstrations for integrated situational awareness and risk assessment capabilities, notably with a view to reinforcing preparedness for multi-sectorial crises.

The value and potential of solutions provided (usefulness, scalability, modularity, reliability, affordability) for future deployment will be assessed and demonstrated in realistic conditions through clear, measurable indicators. Through this, success and EU added value achieved in the demo project will be described and measured on the basis of a qualitative and quantitative assessment.

Topic SEC-2013.4.1-2 Better understanding of the cascading effect in crisis situations in order to improve future response and preparedness and contribute to lower damages and other unfortunate consequences – Capability Project

Description of topic:

Due to strong interdependencies between different sectors in society and between different countries, there is a need to better understand the cascading effect and cross-border effects in crisis situations. This would improve future response and preparedness and contribute to lower damages and other unfortunate consequences. Since this is rarely addressed in current regional/national research activities, that kind of research with a high EU added value would improve the planning for EU Civil Protection and crisis management operations.

The cascading effect in crisis may indeed cause major impacts and damages if the society is not well prepared and not equipped for quick response to such situations. The nature of a crisis (interaction between the physical phenomena and the human activities) often requires prediction tools providing multi sectorial foresight of possible consequences of incidents combined with measures taken by public authorities and first responders including the communication to the public.

In order to be better prepared for and more efficiently take decisions before and during the incident there is a need to develop foresight tools and decision support tools.

This project should first look into different representative crisis scenarios and identify the different originators or large scale disasters and their dependencies with other crisis originators and aggravating factors, thus identifying the possibility for a “cascading effect”. The result of this should be a model and/or methodology to identify dependencies and the events leading one to the other.

The project should also identify the human activities in the crisis – their impact on the event, and the impact of the event on the human behaviour. The project should have a wide approach looking into the general public, the media, the first responders and their commanders and the decision makers at different levels. This model has to specifically identify the key points in the incident evolution where decisions are needed, and identify the type of decisions needed, including preventive decisions.

These key decision points should be incorporated into the incident evolution tool. The tool should enable the simulation of different scenarios (different physical phenomena, different decisions at different point in time) and their effect on the end results, in order to provide decision makers, incident commanders with the capacity to test their emergency and contingency planning. The tool has to be user friendly to the degree that it will enable the use during an actual crisis to improve the decision taking. It should identify critical decision points and bottle necks. It has to be designed to support cross border operations and The tool has to be developed in close cooperation with end-users – first responders, emergency managers, decision makers, while taking into account a wide European perspective. An extensive training module for the end-users could also be considered.

The proposal should take in account technologies and results of FP7 and national projects in this area.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

The project will produce models of dependencies and effects in crisis situations (of both physical and human components) causing a cascading effect. It will also provide a methodology to create this model for future threats, and tools to foresee the evolution of an incident, based on the physical properties, critical infrastructures properties and risks, human behaviour, the decisions taken and their timing. These tool(s) will be available on real time basis as well as for planning and training purposes, in particular in cross border crisis situations.

Topic SEC-2013.4.1-3 Development of simulation models and tools for optimising the pre-deployment and deployment of resources and the supply chain in external emergency situations – Capability Project

Description of topic:

The objective is to develop simulation models and tools for different crisis situations, which aim at improving planning and preparedness of the various resources and capacities, state material reserves included with supply chain needs in the rapid reaction in external (outside the EU territories) emergency situations. This should apply to both the pre-deployment and deployment of resources and the supply chain.

The proposal should take into account technologies and results of FP7 and national projects in this area. Testing, validation and cross border demonstrations in the field with relevant end

users are expected in order to illustrate the EU added value of such an initiative. It should also include key qualitative and quantitative indicators to measure progress or results achieved during the project compared to the state of the art.

Proposers for this topic should take into consideration the current EU external policy in the area of crisis management.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

This project should contribute to improve EU external emergency crisis operations. It will develop a base line for external interoperability of logistics over regions and countries outside the EU.

The following outputs are expected: basic definitions for equipment descriptions and equipment functionality, standard operating procedures, an identified legal framework for the logistics response and technical tools for planning the amount of resources required, their pre-deployment, mobilisation during a crisis, tracking on real time and lessons learned.

Topic SEC-2013.4.1-4 Development of decision support tools for improving preparedness and response of Health Services involved in emergency situations – Capability Project

Description of topic:

Healthcare systems have an essential role to play in the response to emergency situations that in many cases have a negative impact on human's health – varying from direct injuries, diseases, long-term effects of radiation, handicap, to effects on the mental health of the affected population, and the health effects of sudden poverty.

Given the importance of health services in emergency large-scale and/or crisis and disaster situations, the consequences of them being unprepared could be particularly dramatic in terms of casualties, panic etc. Therefore, the development of tools to improve their preparedness and response is of utmost importance.

Although their role in the response is clear, in some cases healthcare services are not perceived as part of the “security” arena, thus tools and procedures for preparedness and response are lacking.

This project should target the preparedness and response phases of the emergency situation by creating:

1. Common grounds for interoperability of medical services in a disaster (at a local, regional and cross border response), by creating a common taxonomy, operational definitions for equipment – descriptions, performance requirement, a suggested minimum training requirement per performance.
2. A threat analysis with relevant reference scenarios.
3. A methodology for preparedness – prioritising the scenarios, creating the required standard operating procedure, identifying the necessary coordination with other stakeholders, identifying the required resources, the necessary training.
4. A methodology for validating each component and the preparedness as a whole. The project should demonstrate this whole cycle with a real health care system on at least two different scenarios.

5. The intelligence and analysis of gathering tools, with the relevant modules to alert the occurrence of an unusual biological event (weak signal detection), predict the evolution of the scenario, create the operational picture and share the information with all the relevant stakeholders.
6. The logistic models for assessing the needed stockpiles of necessary equipment, medications, vaccinations and personal protective equipment, their positioning and restocking (to avoid expiration).
7. The tools used for the creation of surge capacity in the event of a major health crisis. This topic should include the use of volunteers and of cross border assistance (including the legal implications).
8. The coordination mechanisms within the healthcare sector and with other security agencies, nationally, cross border and with international organisations.
9. An analysis of the measures planned to deal with a major health incident, their social acceptance, legal and ethical implications.
10. The training methodologies needed for training and creating the required knowledge and skills as well as of those required for refresher training and retention of knowledge and skills.
11. A post crisis evaluation tool, with a clear methodology for identifying lessons learned, documenting them and implementation of the necessary changes (including an evaluation of the effectiveness of the implementation).
12. Improvements identified for current Incident Management tools, in order to improve their response and usage in healthcare emergency sector, and incorporate the findings of the previous points.

Proposers for this topic should look for an enhanced SME participation as described in Part 1 of the work programme.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

This project will improve preparedness and response of health services involved in large scale and/or cross border emergency situations, by developing a comprehensive set of tools including scenarios, technology, operating procedures, training programs, logistics tools, legal, ethical and public acceptance studies that will be applicable to the health care domain. This will combine applications at local, regional, cross border and international levels.

Topic SEC-2013.4.1-5 Preparing societies to cope with large scale and/or cross border crisis and disasters – Coordination and Support Action (Supporting Action)

Description of topic:

Large scale, cross-borders hazards and/or cross-border disasters (natural or manmade) directly affect the citizens who are at the same time also those who will react first to respond to their needs as well as to those of their peers. Preparing societies and the population to cope with crisis and disasters including building community resilience through involving the population in all stages of the crisis management cycle is therefore essential. As an example, earthquake preparedness programmes demonstrated the importance of public education in reducing the number and severity of casualties as well as creating real capacities in the public.

Studies on resilience at individual level have shown, however, that people do not prepare for low probability hazards. Empowering persons as well as communities should therefore build on issues that already have people's attention. Communities will already have formed social

networks around these issues which may as well be mobilised during crisis. A starting point in community resilience is, therefore, to find out which issues are important to them and how these communities are organised into social networks.

This project aims at identifying best practices as well as creating novel tools and programmes for preparing the society to cope with crisis and disasters including building community resilience and early warning.

The project should include (not exclusively):

- Identifying the crisis and disaster scenarios where society preparedness will have the greatest impact, possibly including complex scenarios with cascading effects.
- Developing cross-hazard situational awareness and risk assessment methodologies including impact identification and prioritisation schemes with a view to reinforcing preparedness.
- Understanding behavioural responses to risks and emergencies, the way the public perceive the threat, their expectations from the authorities, their expectations from themselves and their community, their motivation to take preparedness actions. This should take into account the social and cultural context.
- It should include the risk perception of citizens regarding risks they are not usually expected to come across in their own country.
- The ability of local and national administrations to deal with residents and non-residents, especially in touristic areas/countries.
- Identifying best practices and lessons learned from existing and past community preparedness programmes.
- Creating a comprehensive approach to community preparedness, looking into different groups in the society, applying a multi hazard approach whenever possible, understanding the learning needs and styles of the community members and creating the framework for long-term preparedness processes, including training. This process has to be a participatory process with the community, as much as possible.
- Creating a sample training curriculum and tools, using different training methodologies, targeting different groups in the society to various hazards to the community.
- Preparing citizens for the types of public engagement that will be used for public messaging in crises and emergencies.
- Providing a methodology to assess the effectiveness of the training programme and to assess the level of preparedness of the community. The project should include a pilot project and indicators, to demonstrate the effectiveness of the tools created.

Funding schemes: Coordination and Support Action (Supporting Action)

Expected impact:

This project should create reliable methodologies to effectively prepare the community to encounter and build resilience to a large scale, cross-hazard and/or cross border crisis and disaster situation, the methodology to assess the level of the community's preparedness and the tools to effectively train and retrain the community.

Topic SEC-2013.4.1-6 Preparedness for and management of large scale forest fires - Integration Project

Description of topic:

Large scale forest fires have become in recent years a recurrent phenomena resulting in deaths, major economic loss and long lasting effects on communities. Fire fighting techniques have evolved over the years, introducing fire propagation models, fire retardant materials and air fighting among others. These tools needs to be adapted to the reality of people living in what used to be only forest, which makes the "safety barriers" smaller and at the same time the fires more violent and more frequent.

There is also need to integrate into the fire fighting arena tools such as air and land space observations, as well as information to the public affected by the phenomena. Health aspects of the incident and the fire fighting as well as the environmental aspects (including the dispersal of toxic materials, held in facilities affected by the fire) have to be studied. The legal and ethical aspects of the measures used in the management of the incident (e.g. mandatory evacuation, and the use of force to enforce this evacuation) have to be highlighted. Since this type of incidents often requires international cooperation, interoperability issues both in equipment as well as in common operations procedures (between countries) should be studied, and standardisation activities suggested. Proposers should also take into account the possible environmental impacts (e.g. contamination of water) of the chemicals used by fire fighters.

Some critical infrastructures should be taken into account when they are directly affected by large scale forest fires (highways, energy grids, pipelines). Specific urban fires or fires that affect only critical infrastructures or industrial facilities should not be targeted.

Possible areas to be addressed in research:

- (i) Real time risk analysis
- (ii) Fire monitoring
- (iii) Disaster management, operational and tactical response
- (iv) Innovative passive and active protection measures, with emphasis on active fire protection
- (v) Predictive models for fire propagation and fire control

Critical infrastructures that should be considered:

- (i) Transport (highways and railways going through forests)
- (ii) Energy supply (High voltage grids/pipelines in forest areas)

Objective:

- To develop better tools for fighting mega-fire (especially mega bush fires threatening the public and their livelihoods). These tools should include – modelling tools, monitoring tools and technologies, fire fighting technologies and tools, standard operating procedures, information to the public, public behavioural models, health risks (from the fire retardant materials, to the responders, general public), ethical and legal aspects, environmental impact.
- To develop advanced monitoring tools over large forest areas in order to fast detect and accurately locate fire;

- To develop modelling tools to estimate the progress of a fire (wind and meteorological conditions are of paramount importance in the model) and to indicate highest probability of fire focal points
- To develop situational awareness tools for the command room and the field forces, a special emphasis should be given to the multi-cultural and linguistic nature of the European continent, also in terms of public behavioural models (cascading environmental/social impacts)

To develop methods and procedures to effectively plan and supervise international forces collaboration (including coordination of aerial fleet over relatively small areas). Seamless coordination of the aerial operation and the ground operation is mandatory.

Funding schemes: Collaborative Project (large scale integrating project)

Expected impact: Better methods for fighting mega fires will make the European citizens safer. Having a comprehensive tool for the management of mega fires (including, health, environmental, legal and ethical aspects), should increase the efficiency of the management of this type of incidents. Besides the project should improve preventative measures, enhance the use of predictive modelling ensuring greater resilience, enabling better response, and addressing issues of standardisation and interoperability across Europe.

Area 10.4.2 Response

Topic SEC-2013.4.2-1 Fast rescue of disaster surviving victims: Simulation of and situation awareness during structural collapses including detection of survivors and survival spaces – Integration Project

Description of topic:

The overall objective is to decrease the time to rescue surviving victims after a major disaster, whether it is due to natural or man-made causes.

More particularly wide-area situation awareness and survivors location solutions should be developed for rescue teams (first responders), during structural collapses. There is a specific need for a deeper understanding and analysis of typical scenarios of structures failures (collapsed buildings) and their damages depending on current and expected building materials and methods (e.g. reinforced concrete, framework of steel or reinforced concrete, glass constructions). In addition there is a big need to get an overall picture of trapped persons in collapsed buildings (to avoid a long search for survivors centimetre by centimetre in the whole destruction site).

Further, development of new rescue and recovery methods and devices which correspond to the state of the art building materials and methods (e.g. mission security systems measuring movements of debris, positioning systems, tools for cutting thick walls or girders) as well as integration of state-of-the-art location technologies (mobile, radar,...) should be carried out. These technologies, methods and devices should provide capabilities for simulation, location, detection and situational awareness during structural collapses, including fast detection of survivors, survival spaces and rescue of disaster victims. Hereto, various data sources should be harnessed that provide information about the building before and after its collapse, e.g. blue prints, satellite pictures, maps and real-time location information (integrated as coordinates on maps), photos, user-input and 3D laser scanners.

The project could also consider other disaster situations (like for example flooding, earthquake, fire, explosion...) where fast rescue response is crucial for the surviving victims.

Developments proposed in the project should be based on clearly identified end-users requirements. It should include field trials in simulated and real conditions, testing and validation activities.

The final solutions developed in the projects should be ideally:

- Mobile, quick and reliable (providing information on trapped persons in accuracy of few meters within a couple of minutes);
- Providing a clear added value to rescue teams decision making;
- Communicating and based on input information/data easily available (pictures from the scene for example);
- Ergonomic and intuitive (very simple use on the field);and
- Secured (for security and to protect data and privacy).

The proposal should take in account and integrate existing technologies and available results in particular from FP7 projects in this area.

Proposers for this topic should look for an enhanced SME participation as described in Part 1 of the work programme.

Funding schemes: Collaborative Project (large scale integrating project)

Expected impact:

It is expected that the results of this integrated project will improve and contribute to shorten the time to rescue response, while saving victims and lowering the level of injuries for victims as well as rescue teams. The project will improve the general ability to rescue people from collapsed structures (buildings). It will indeed help first responders to better plan and avoid hazardous rescue operation. Key measurable indicators will demonstrate the expected impact.

It is also expected a better harmonisation of the response, by common procedures, tools and methods across borders, as well as solid training of the first responders to the new solutions.

Examples for possible research outcomes:

- Linking the actual measured data with existing building plans, real-time warning and connection of a 3D laser scanner to identify debris
- Development of a 3D modelling of the mission's place
- Development of standards and guidelines

Area 10.4.3 Recovery

Topic SEC-2013.4.3-1 Shaping immediate relief action in line with the goals of development co-operation in post crisis / post conflict societies to maintain stability – Capability Project

Description of topic:

The EU's holistic approach recognises the need for immediate action in crisis/conflict situations as well as the (longer-term) need to stabilise the situation and ensure security of civil society after crisis/conflict.

Thereby development cooperation, in the field of health and education, plays a crucial role to maintain and create societal security and stability, thus avoiding the relapse into insecurity. The EU already has operational funding in place via the Instrument for Stability which aims at establishing (or re-establishing) conditions essential to the proper implementation of the EU's development policies and equally through funds managed by the Directorate-General for Humanitarian Aid and Civil Protection.

Research work to be funded under this topic should support these activities; specifically the interactions between the immediate crisis/conflict relieve action, with the goals of the longer-term development co-operation. Of specific importance is the identification of immediate actions that might impede the longer-term goals. Lessons learned and further recommendations need to be developed to help policy makers and those defining relieve/rescue immediate actions to shape the crisis management activities to ensure security.

European technology, especially in field-based informatics and telecommunications, is highly developed and of particular relevance in this area. Applications for data capture in remote areas and from mobile stations can be key in monitoring emergent situations and planning rapid response. European technology to detect and rapidly respond to unusual or rare pathogens can be critical in isolating and containing diseases of pandemic potential. For example, critical information can be obtained through these technologies in situations where access to remote areas is a challenge. Adaptation of such technologies beyond the state of the art to the specific situation of post crisis/post conflict should be analysed.

The proposal should take into account technologies and results of FP7 and national projects in Social Sciences and Humanities and in other areas.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

The work should start by a study of the most important relieve actions by the EU and by the EU Member States as well as non-EU actions, in recent crisis/conflict situations. The actions thereby taken should be mapped against a) the immediate effectiveness, and b) its longer-term impact on the society/population. Beyond state of the art technologies should be tested. A 'lessons-learned' based 'do and don't' should be presented and disseminated to those concerned (planners, policy makers etc.).

Area 10.4.4 CBRN response**Topic SEC-2013.4.4-1 Tools for detection, traceability, triage and individual monitoring of victims after a mass CBRN contamination - Integration Project****Description of topic:**

Research and activities in order to identify, trace and monitoring of a large number of people in case of a massive CBRN (Chemical, Biological, Radiological or Nuclear) contamination is needed. This should allow to rapidly identify persons at risk (potentially contaminated) with

the view to treat them in a rapid and appropriate way, including methods to differentiate between contaminated or not contaminated persons on-site or in hospital zones.

In this context, the objective of this project is to integrate existing tools and procedures along with the development of novel solutions in order to (non exhaustive list):

- Rapidly identify and assess the risk of contamination of persons exposed or that have been in contact with possible source of contamination (by a Chemical, Biological or Radiological contaminant).
- Rapidly identify and assess the level of contamination / exposure (including making use of point of care diagnostic tests).
- Establish a decontamination / treatment / medical follow up based on the level of contamination / exposure.
- Ensure the tools and procedures fit in overarching search & rescue systems.
- Establish guidelines and triage standard operational procedures for hospitalisation and admission to intensive care units (or other specific units) based on the risk assessment data.

Proposals should try to cover as much as possible listed needs for C, B and/or RN and take into account the account technologies and results of FP7 and national projects as well as the ongoing EU policy developments.

The Ethical implications and social acceptance of the proposed solution(s) have to be addressed specifically.

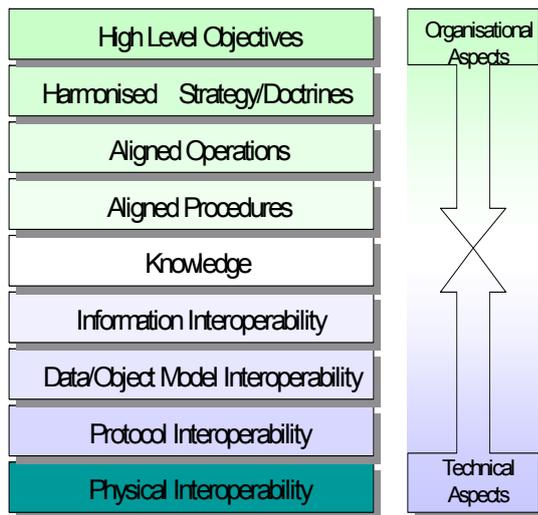
Funding schemes: Collaborative Project (large scale integrating project)

Expected impact: Breakthrough on detection and monitoring capabilities of contaminated persons (C, B and/or RN) to the benefit of first responders, civil protection and public health services. In addition, this project is expected to provide a new integrated, interoperable and centralised system approach involving stakeholders in case of a mass CBRN contamination

Activity 10.5 SECURITY SYSTEMS INTEGRATION, INTERCONNECTIVITY AND INTEROPERABILITY

Activities related to intelligence, information gathering and civil security will enable and/or contribute to the performance of technology required for building up the above listed capabilities, thus focusing on cross-cutting issues such as: enhancing the interoperability and intercommunication of systems, equipment, services and processes, including law enforcement, fire fighting, civil defence and medical information infrastructures, while ensuring their reliability, protection of confidentiality and integrity of information, traceability of all transactions and their processing, etc. Activities will also address standardisation and training matters (including such with respect to cultural, human and organisational interoperability).

This mission area seeks research targeted to solving practical interoperability, intercommunication and interconnection issues in the security field, with a holistic and cross-cutting approach, while ensuring reliability, confidentiality and integrity of information.



Its focus is to target the interoperability requirements of horizontal or enabling technologies, processes or other layers of the interoperability stack, that can be applied to several different scenarios, as those covered by mission areas 1 to 4.

Important elements in this activity will be: communication and interaction among different organizations and nations; relationship among end-user's processes, training and technological issues; Interactions between technological and organizational factors; interoperability between information and command functions; interoperability among different equipment

deployed in security incidents.

This activity is divided in four areas: **Information Management; Secure Communications; Interoperability; and Standardisation.**

Area 10.5.1 Information management

Topic SEC-2013.5.1-1 Analysis and identification of security systems and data set used by first responders and police authorities – Capability Project

Description of topic:

The first objective is to create a pan-European inventory of:

- past critical events/disasters and their consequence including the time dimension and the response given in terms of means used, costs, etc. again with the time dimension;
- information about the data sets, the daily information management tools and processes, the integration into crisis management procedures and the information systems used by first responders and police authorities in disaster and crisis management procedures; and
- how crisis and emergency management services are deployed in terms of organisation business model: in-house, outsourced, etc., and how each approach affects the service.

The final objective is to derive from this collection of information a taxonomy and a network enabled communication system concept (“common information space”) to be used at European level with a view to enable collaboration processes and exploitation of information from different sources and across borders. A particular effort will be put into identification of new possible emergency and crisis management models. For instance, should be considered: multi-agency systems, i.e. systems deployed to provide service to same-purpose, different geographic area responsibility agencies so they can benefit from cost sharing while maintaining their service independence.

In addition, the research should cover regulatory aspects as well as restrictions identified for emergency management practices and tools (laws, social practices and culture, etc.) that should be taken by European industry in the field of study, in order to adapt its offering to each member state restrictions. In addition, service provisioning aspects should be covered (outsourced services, outsourced technologies, etc.)

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

It is expected to allow for interoperability at operational level (multi-agency, cross-border guidance capabilities) and new ways of service provision in the field of public safety and crisis management activities. It is also expected that research should start standardisation activities in this area and create a level playing field for industry to facilitate the development of an EU market.

Topic SEC-2013.5.1-2 Audio and voice analysis, speaker identification for security applications – Integration Project

Description of topic:

In the course of investigations, numerous audio data are at the disposal of law enforcement agencies (LEA). Terrorist threat or attack claim, hostage takings, demand of ransom, wire-tap during crime investigations, audio records in busy/noisy environment are some examples of the situations LEA can face.

The objective of this topic is to improve the technical capabilities to identify individuals through the speaker's voice recognition. There are numerous research issues at stake such as: better recording devices, taking into account new media, new innovative analysis algorithms, real time audio data analysis, language recognition, speaker identification and management of large audio databases. The project should propose and integrate innovative algorithms and solutions for speaker recognition that will fully comply with ethics and privacy EU regulations. Societal aspects (e.g. perception of security, possible side effects of technological solutions, societal resilience) have also to be taken into account in a comprehensive and thorough manner.

Proposers for this topic should look for an enhanced SME participation as described in Part 1 of the work programme.

Funding schemes: Collaborative Project (large scale integrating project)

Expected impact:

It is expected to extend the capability of LEA with innovative and operational tools and solutions in this area. It should pave the way to standardisation in this area as well as validation and certification of the proposed solution, and to facilitate level playing field for industry in this sector as well as the creation of a European market.

Area 10.5.2 Secure communications

No specific topic for this area has been planned for this call.

Area 10.5.3 Interoperability

Topic SEC-2013.5.3-1 Definition of interoperability specifications for information and meta-data exchange amongst sensors and control systems – Capability Project

Description of topic:

Command and control technological systems are nowadays at the core of the C3 (command, control and communications) human function at most complex operations, as a key element for augmenting and assisting command in the decision making process. These systems depend upon the reception of raw data or pre-processed information transmitted from multiple sensors and sources.

However, the efficient integration of information from these sources can be extremely challenging, technologically complex and time consuming, as well as very expensive. This forces the use of specifically tailored integrated solutions, for which the exchange of components from different vendors or the integration of new ones can be very difficult.

Reasons for this are factors such as: the increased number of joint operations, where information is sent by first responders from different nationalities or organizations, or just using different technologies; the wide diversity in the nature of the possible sources and signals, the growing number of possible sensors to be used, their nature (e.g.: autonomous or networked, simple or intelligent); differences in their environment; time constraints for the response; or just the speed of technological evolution. All these have to be considered.

The task is, first, to describe and create an as large as possible inventory of representative real life examples of sensors, control systems, communications, and architectures for different scenarios in the security field. A second task is to define a taxonomy and propose a framework that could evolve into a standard specification for interoperability (physical, electrical, data, etc.) between sensors or other sources, and command and control systems, with the aim of helping the development of a European market in this field. The project should also specify the framework in order to allow future devices interoperability.

The proposed framework should enable effective exchange of information between different rescue units, public safety units and crisis management information systems operating together without any special technical prearrangements, e.g. in case of activities within the European civil protection cooperation framework or when participating in the international relief operations.

The definition of common interfaces, data structures and procedures should take into consideration both the functional and the operational requirements for their use in the security field enabling the exchange of data, as well as security requirements and legal constraints.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

To start standardisation activities in this area which would help:

- to have common specifications for similar functions;
- to allow for validation and certification of sensors and sensor systems;
- to facilitate interoperability of sensors and sensor's systems; and
- to create a level playing field for industry to facilitate an EU market.

Topic SEC-2013.5.3-2 Testing the interoperability of maritime surveillance systems – Pre-Operation Validation

Description of topic:

Legitimate and unlawful activities developing in ports, coastal waters and high seas are deeply influenced by the absence of geographical delineations; maritime security relies abundantly on a comprehensive and enhanced maritime picture of the full set of sector activities in the maritime area. Addressing security challenges developing in the European maritime domain relies therefore on the integration of maritime surveillance and on a better cross-sector and cross-border approach.

An integrated maritime surveillance over the European maritime domain would provide more effective situational awareness at sea, including for security and safety purposes. It would contribute to the fight against unlawful activities (e.g. drug smuggling, trafficking in human beings, irregular migration and terrorism at sea and from the sea). Improved situational awareness of activities, and better knowledge of maritime environment, would also enhance decision making with respect to incident management and timely interventions at sea, contributing to optimising the operational management of intervention missions dealing with security, safety and environment protection.

The EU defined its objective to set up a Common Information Sharing Environment (CISE) for the maritime domain⁴¹. This requires cooperation across sectors (i.e. border control, customs, general law enforcement, defence, control of maritime pollution and marine environment, fisheries control, as well as the economic interests of the EU) and borders.

Several pilot projects (such as MARSUNO and BlueMassMed (European Commission Directorate-General for Maritime Affairs and Fisheries as well as BlueBelt and e-Maritime (European Commission Directorate-General for Mobility and Transport)), selected components of EUROSUR (European Commission Directorate-General for Home Affairs), and operational initiatives, like MARSUR (European Defence Agency) and SUCBAS (Baltic Sea Navies), have demonstrated the need to shift from the conventional “*need to know*” approach towards a cross-sectorial and cross-border “*need and responsibility to share*”.

The projects mentioned above have already proven cost-effective approaches for trans-sectoral data sharing. What remains as technological challenge is the cross-sectoral dimension where legal constraints have to be implemented by secure and selective information exchange, with functionalities agreed and trusted by all end-users (access right policies, information exchange security policies, information services). Indeed, even though authorities would be connected and exchange information within CISE, be it at the Member State's agency or individual level, they must always act according to the person's agency of origins duties, rights and competences. The complexity of these functionalities relates therefore to the wide diversity of user communities, each of them having specific kind of data and rules for handling them, the heterogeneity of the current legal framework, and the high number of institutional actors.

The anticipated implementation of CISE at the full EU/EEA scale is estimated to eventually correspond to a de-centralized interoperable and trusted cross-sectoral data exchange environment between over 400 relevant public authorities and administrations, whose information system, and data, widely differ in terms of architecture, capability and

⁴¹ http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/EN/genaff/122177.pdf

functionality. Developments in this area imply the achievement of a higher level of integration of systems and components in a heterogeneous environment.

Interoperability, both technical and functional (i.e. the ability of systems to provide services to, and accept services from, other systems and to use the services so exchanged to enable them to effectively operate together), is a must for the coherent development of operational information exchange capabilities in a trans-national environment. For each system efforts would be required both at the internal level, setting homogeneous requirements for handling and display of information, and at the external level, facilitating the interfacing of systems.

The aim of this POV is to test and validate the CISE concept (surveillance standard), under realistic operational and formal conditions, for the cross sectorial data exchange at EU/EEA level in a test-bed connecting the systems of only a subset of the concerned EU/EEA public authorities. The pre-operational validation of this tested solution is expected to prepare the way towards the later implementation on a larger scale across Europe. The POV shall be organised while respecting the Treaty principles, the competition rules and the specific requirements indicated in the Appendix.

The proposed topic shall be seen in line with the EU Integrated Maritime Policy and the EU Internal Security Strategy. It aims at stimulating national authorities and the industry to converge for the development and test of interoperable information sharing tools, in order to validate solutions for cross-sector and cross-border information exchange.

The topic is to be implemented via the CP-CSA funding instrument, which involves a combination of the collaborative project and coordination and support action funding schemes. It enables therefore the financing, under the same grant agreement, of research, coordination and support activities.

This CP-CSA for POV will combine two components with synergistic effects:

- a. Networking and coordination activities: for public bodies in Europe to cooperate in the innovation of their public services through a strategy that includes POV.
- b. Joint research activities: related to validating the POV strategy jointly defined by the public bodies participating in the action. This would include the exploration of possible solutions for the targeted developments towards a prototype for CISE, and the testing of the proposed solutions against a set of jointly defined concepts of operations and performance criteria.

In this scheme, in order to support cooperation between public authorities participating in the preparation and management of the POV, the joint POV procurement for the development, test and validation of the network of systems will be accompanied by a coordination and support action (CSA). The CSA support aims to enable participating authorities to prepare, define and jointly (in coordination with other relevant EU organisations, as appropriate) implement the POV procurement, and later jointly assess its outcome.

The nature and the objectives of this indirect action are such that it requires the participation of at least three independent public authorities in charge of maritime surveillance in different sectors (at local, regional, national or supra-national levels), each established in a different Member State or Associated State. However, the nature of the challenge is such that a larger number of participants are encouraged.

Although the application focus of the action is to remain civil, at least one of these participating authorities should belong to the defence community in order to ensure a comprehensive approach in the sharing of defence information useful to the civilian tasks at sea, in order to avoid duplications. Other stakeholders (e.g. EU agencies), may participate in addition, if their participation is well justified and adds value to the action, e.g. if:

- a. they represent an authority or a regulatory body with responsibility in some area affected by the use of a particular technology,
- b. their support is required in order to facilitate the technical, administrative, financial or managerial procedures for which national authorities are limited by their respective national regulation.

The participating authorities should test the exchange of information through surveillance services (testing CISE standard) in order to obtain the best situational awareness picture available, for their own mission, based on multi-sectoral and cross-border sharing at least between their systems and with EU systems like SafeSeaNet, MARSUR, EUROSUR, Cleanseanet, Emodnet and VMS.

The overall project duration is expected to be between 18 and 27 months.

SCOPE of the CP-CSA (Collaborative Project and Coordination and Support Action)

In the context of the European Integrated Maritime Policy and of the EU Internal Security Strategy, this CP-CSA is to conduct pre-operational validation of tools for the common information sharing environment at sea at EU/EEA level via the competitive development testing and assessment of a potential solution.

The specific objective of this project is to have a test-bed network of systems connecting participating public authorities developed for cross sectoral data exchange and tested in particular to assess, in the context of CISE:

- the technical feasibility of option(s) for the Common Information Sharing Environment (CISE) at sea;
- the identification of technological alternatives for the achievement of the set of user-defined operational objectives;
- the demonstration that there are existing innovative solutions (services) which provide the required capabilities;
- the feasibility of the integration of the proposed solution, taking into consideration the limitations imposed by the existing surveillance systems;
- the performance under realistic operational and formal conditions of the test bed developed;
- the cost-benefit ratio of the option(s) tested;
- the identification of the maturity level showed by the solution(s) in order to promote short/mid term utilisation;
- the definition of innovative applications, business models and procurement schemes that can facilitate the migration to these new solutions from the existing tools;
- the evaluation of the experimentation results promoting their widening to future solutions; and
- the definition of advisable technical management structure for CISE.

As part of the project activities, the industry shall be called to provide solutions to be tested and validated according to the concept developed by the consortium participants based on CISE definitions and rules provided by the European Commission in due time before testing and validation. In order to guarantee an independent and reliable validation process of the proposed solutions, a mechanism has to be enabled that supports the activity of the different actors throughout a series of steps.

The overall validation action **CP-CSA** is to be divided in the following three phases.

1) Initial Definition Phase (CSA):

The definition phase should be based on the latest relevant requirements for CISE. It should build on the specifications being set by the relevant expert group.⁴² This can also be seen as a follow up of the pilot projects “Marsuno” and “BlueMassMed” where the needs of Member States for higher level of interoperability have been affirmed.

The challenge is to undertake the proper cooperative R&D work and validate it with a sufficiently representative set of institutional actors. Public sector requirements for interoperability, information security and data portability will therefore have to be considered across the participating authorities (and sectors).

Participating authorities are expected to present their cooperative plan (access to their surveillance services) for definition of the later phases, in coordination with other relevant EU organizations (where appropriate).

The consortium shall set up appropriate IPR rules with a view to allow authorities of non participating Member States/Associated Countries (and European authorities) to make full use of the developed technologies.

For these reasons, in this CSA a strategy shall be put in place for:

- Identification of elements requiring new R&D that should be tested and validated in cooperation⁴³;
- Definition of an action plan, setting scenarios and issues for concrete implementation of activities;
- Establishment of modalities and procedures for POV evaluation and monitoring (common evaluation criteria and implementation methods);
- Drafting a preliminary CISE IPR strategy for the (expected) outcome of the Call for Tender, taking into account the provisions set out in the Appendix;
- Allocation and training of additional resources for implementation (if appropriate);
- Building cooperation with other stakeholders (if appropriate).

The outcome is expected to be a Needs Analysis Document and a Validation Strategy Document, including a practical Exercise Plan for the actual development and testing phase, to be used for the definition of the specifications of a joint POV Call for Tender for the subsequent execution phase, setting the rules for participation, the criteria to evaluate

⁴² See: "*Member States Expert Group for Integrated Maritime Surveillance*"
<https://webgate.ec.europa.eu/maritimeforum/content/2657>

⁴³ A pre-study on the landscape of existing situation of systems and projects is expected to be completed by June 2012. A study of the technical definition of CISE environment will be launched in July 2012 and technical requirements are expected to be ready mid 2013 well before testing and validation.

competitive tenders, and for selection/award of the tender. Such call shall be defined in such a way that it respects the Treaty principles and the specific requirements in the Appendix.

2) Preparatory Work and Execution Phase (CP):

This phase will implement the strategy and action plan as prescribed by the participating authorities in Phase 1 (in particular the Call for Tender for implementation and testing).

In this phase the providers of solutions to be implemented and tested will execute their work according to the prescription of the action plan, working under the supervision of the concerned participating public authorities, having the network of systems tested by them for cross sectoral data exchange under realistic operational and formal conditions.

The Implementation Plan is expected to be contracted during 2014-2015 and implemented in 2015. Operational testing of the developed network environment should last at least 6 months.

3) Final Ex-post Assessment Phase (CSA):

In this phase, which will conclude the overall validation, participating public authorities, in coordination with other relevant EU organizations, will conduct a thorough assessment of the performance of the network of systems, as demonstrated in the testing exercises of phase 2, against the set of jointly defined performance criteria. The aim will be to verify its fitness for purpose in terms of implementation of the CISE concept, with a view to a later potential conversion of the systems tested into services. This phase should confirm, as appropriate, the IPR strategy and include dissemination of results to standardisation bodies (if appropriate). This ex-post assessment of the outcome is expected to be implemented in the first half of 2016.

For implementing this CP-CSA, different constellations for joint validation⁴⁴ are allowed, such as for example common validation entity⁴⁵, lead authority⁴⁶ and piggy-backing⁴⁷ constellations.

EU CONTRIBUTION

The EU contribution shall take the form of a grant that will combine the reimbursement of:

⁴⁴ "Joint validation" means combining the validation actions of two or more contracting authorities. The key defining characteristic is that there should be only one tender published on behalf of all participating authorities.

⁴⁵ The "common validation entity" constellation is an arrangement for joint validation where all involved public authorities commonly establish or designate one external legal entity to conduct the joint validation with a joint mandate and joint resources of all public purchasing authorities. This entity shall be integrated among the project beneficiaries in equivalent conditions in terms of rights and obligations, and support the decision process, facilitating the development of a validation strategy and the arrangements for launching a competitive call for the demonstration of surveillance capabilities.

⁴⁶ The "lead authority" constellation is an arrangement for joint validation where a group of public authorities collaborate through their existing departments in such a way that one public authority of the group is designated as lead authority to take responsibility for, tendering and arranging contractual documentation for specific validations, all in consultation with other purchasing authorities involved in the joint validation.

⁴⁷ In the "piggy-backing" constellation one public authority executes the validation and provides access to the results of the contract for a wider range of authorities, essentially by stating in the Contract Notice that other named public authorities may also wish to make use of the resulting contract a later date (normally during the timeframe of the original contract).

- 100% of the total eligible costs (the reimbursement of the indirect cost may reach a maximum of 7% of the direct eligible cost) of the participating authorities for the activities linked to the preparation, definition, management and coordination of the joint POV Call for Tender (CSA phase 1),
- maximum 50% of the total eligible costs for the research and technological development activities charged by the providers of solutions to be tested (75% in case of "*Market failure and of accelerated equipment development*"⁴⁸) (CP phase 2), and
- 100% of the total eligible costs (the reimbursement of the indirect cost may reach a maximum of 7% of the direct eligible cost) of the participating authorities for the activities linked to the final validation of the outcome of the execution phase (CSA phase 3).

It is clear from the above that, in addition to the EU financial support to phase 2, participants shall contribute directly to the research and technological development activities involved in the testing of new solutions. This contribution of the participants to phase 2 can be in kind (e.g. personnel, premises, systems and services).

Expected impact:

This CSA-CP is expected to significantly contribute to the implementation of CISE.

Enhanced maritime awareness will help ensuring more secure, safer and cleaner seas. Search and rescue authorities will make use of better information when people's lives are in danger at sea. Coast Guards, police and navies may better share information to better prevent and combat all kinds of illegal activities at sea or to protect merchant ships, fishing and pleasure boats from all kind of threats. Environmental and pollution prevention and response authorities may better share information with maritime traffic or control authorities, allowing to better prevent, intercept or clean-up pollution at sea.

The commitment (and credibility) of relevant participating public authorities across different sectors is an essential requirements to ensure the later take up of the proposed solution at the EU scale. The output of the project is expected to be a validated technical and operational reference framework, a "test bench" to be used for the setting up of future interoperable systems at a larger scale. At the end of the project, the participating authorities should have obtained clear evidence of the cost-efficiency of the approach. The consolidation of requirements and joint procurement is expected to lead to future reduced costs.

The project is expected to promote increased opportunities for market uptake and economies of scale for the supply side by forming critical mass on the public demand side, and contribute to standardisation of jointly defined public sector requirements specifications.

This project is expected to imply a relevant standardisation component. Common interfaces, data structures and procedures would be necessary for the exchange of data, making security information available where it is needed, while respecting legal and regulatory constraints. Standard procedures are expected to be set up to improve the communications between heterogeneous systems (from operational and technical standpoints).

⁴⁸ Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013) Art 33.1

Impact will be measured essentially in terms of fitness for purpose in the context of CISE. However, the expected impact goes beyond purely technical aspects and covers aspects related with the industrial market of security solutions. Through the execution of the project, participants are expected to verify and optimise their technological choices. Technology providers would increase their understanding of modern operational requirements, with adaptation of existing technologies, and novel research and development, to address the challenges of maritime surveillance, thus increasing their competitiveness. The project has the potential to create important market opportunities worldwide for the European industry and establish a clear leadership in this area.

Appendix: Specific Requirements for the implementation of Pre-Operational Validation (POV)

The following requirements are applicable to POV calls for tender launched under actions requiring POV to ensure that the conditions for the Article 16(f) exemption of the public procurement Directives 2004/18 and Article 13(j) of Directive 2009/81/EC are respected, that the risk-benefit sharing in POV takes place according to market conditions and that the Treaty principles⁴⁹ are fully respected throughout the POV process:

- The consortium of public bodies should verify that the topic proposed for the joint POV call for tender would **fit the scope of an R&D⁵⁰ services contract⁵¹**.
- More than 75% of the EU contribution is expected to fund Phase 2 (Preparatory Work and Execution Phase).
- **The practical set-up foreseen for the POV** shall be clearly announced in the POV contract notice. This shall include the intention to select multiple companies to start the pre-operational validation in parallel, as well as the number of phases and the expected duration of each phase.
- **Functional specifications** shall be used in order to formulate the object of the POV tender as a problem to be solved without prescribing a specific solution approach to be followed.
- In view of triggering tenderers to send in innovative offers that include R&D that can bring breakthrough improvements to the quality and efficiency of public services, the selection of offers shall not be based on lowest price only. The POV contracts shall be awarded to the tenders offering **best value for money**, that is to say, to the tender offering the best price-quality ratio, while taking care to avoid any conflict of interests⁵².

⁴⁹ In particular the fundamental Treaty principles on the free movement of goods, the free movement of workers, the freedom to provide services, the freedom of establishment and the free movement of capital, as well as the principles deriving there from, such as the principles of non-discrimination, transparency and equal treatment.

⁵⁰ R&D can cover activities such as solution exploration and design, prototyping, up to the original development of a limited volume of first products or services in the form of a test series. Original development of a first product or service may include limited production or supply in order to incorporate the results of field testing and to demonstrate that the product or service is suitable for production or supply in quantity to acceptable quality standards. R&D does not include commercial development activities such as quantity production, supply to establish commercial viability or to recover R&D costs, integration, customisation, incremental adaptations and improvements to existing products or processes.

⁵¹ Contracts providing more than only services are still considered a public service contract if the value of the services exceeds that of the products covered by the contract.

⁵² For more info refer to Staff Working Document on PCP: SEC (1668) 2007.

- In respect of the Treaty principles the public purchasers shall ensure **EU wide publication** for the POV call for tender⁵³ in at least English and shall evaluate all offers according to the same objective criteria regardless of the geographic location of company head offices, company size or governance structure.
- In POV, the public validator does not reserve the R&D results exclusively for its own use. To ensure that such an arrangement is beneficial both for the public purchaser and for the companies involved in POV, **R&D risks and benefits are shared** between them in such a way that both parties have an incentive to pursue wide commercialisation and take up of the new solutions. Therefore, for POV, ownership rights of **IPRs** generated by a company during the POV contract should be assigned to that company. The public authorities directly contributing to the POV phase (2), and the institutions of the European Union, should be assigned a free licence to use the R&D results for internal use, as well as the right to require participating companies to license IPRs to third parties under fair and reasonable market conditions, to be specified in the Call for Tender. A call-back provision should ensure that IPRs from companies that do not succeed to exploit the IPRs themselves within a given period after the POV project return back to the public bodies in charge of maritime surveillance.
- In order to enable the public validators to **establish the correct (best value for money) market price for the R&D service, in which case the presence of State aid can in principle be excluded** according to the definition contained in Article 107 of the Treaty on the Functioning of the European Union, the distribution of rights and obligations between public validators and companies participating in the POV, including the allocation of IPRs, shall be published upfront in the POV call for tender documents. The POV call for tender shall be carried out in a competitive and transparent way in line with the Treaty principles which leads to a price according to market conditions, and does not involve any indication of manipulation. The consortium of public purchasers should ensure that the POV contracts with participating companies contain a financial compensation according to market conditions⁵⁴ compared to exclusive development price for assigning IPR ownership rights to participating companies, in order for the POV call for tender not to involve State aid.
- The POV contract that will be concluded with each selected organisation shall take the form of **one single framework contract covering all the POV phases**, in which the distribution of rights and obligations of the parties is published upfront in the tender documents and which does not involve contract renegotiations on rights and obligations taking place after the choice of participating organisations. This framework contract shall contain an agreement on the future procedure for implementing the different phases (through specific contracts), including, if appropriate, the format of the intermediate evaluations after the solution design and prototype development stages that progressively select organisations with the best competing solutions.

⁵³ Through the Official Journal of the European Union (OJEU), using the TED (Tenders Electronic Daily) web portal.

⁵⁴ The financial compensation compared to exclusive development cost should reflect the market value of the benefits received and the risks assumed by the participating company. In case of IPR sharing in POV, the market price of the benefits should reflect the commercialisation opportunities opened up by the IPRs to the company, the associated risks assumed by the company comprise for instance the cost carried by the company for maintaining the IPRs and commercialising the products.

Area 10.5.4 Standardisation

Topic SEC-2013.5.4-1 Evaluation and certification schemes for security products – Capability Project

Description of topic:

Today security equipment and systems are very diverse in technology, concept of operations, application areas and performance. Similar security products are difficult to compare in terms of performances, accuracy, usage, trust they could deserve and validation of the functionalities. Currently, there are very few harmonised certification procedures in Europe applicable and recognised similarly in each Member State.

Lacking a harmonised approach in the EU and Associated Countries across application areas (e.g. critical infrastructure, crisis management) means that incentives for development by the European security systems industry are suboptimal. Mechanisms to independently evaluate security products, on a scientifically valid and statistically reliable basis are sought for development and implementation across the EU.

The task is to study if and how existing evaluation and certification schemes (such as Common Criteria - ISO 15408, and other relevant standards) could be used and possibly further developed/enhanced/adapted/integrated for the assessment and certification of products used for physical security of people and infrastructures. If finally applicable, this should be validated by experiments on some different product types and different methods (e.g. anti-spoofing methods...). The identification of the correct standardisation bodies (and to some extent national standardisation bodies) is a pre requisite. Outputs of the project should feed the identified standardisation bodies with proposals for new work items.

A legal study should also be carried out to analyse ethical and privacy issues as well as existing or upcoming regulations. Finally, the involvement of a few Data Protection Authorities (DPA) (for example through Advisory Groups) is highly desirable, in order to facilitate the emergence of an EU-wide security certification process, the value of which would be acknowledged by all DPAs.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

The project is expected to facilitate a harmonised playing field for the security industry and to enhance the trust of the professional users and thereby of the EU citizen in security products. A clear roadmap with identified milestones and a definition of coverage for the certification scheme is also expected. The provision of accreditation schemes would provide grounds for confidence in the reliability of the judgements on which the original certificates were based by requiring that the Accreditation Bodies should meet high and consistent standards. This should also lead to an evolution of the current EU regulations, for a wide acknowledgement and harmonisation of certification schemes and mutual recognition across all Member States.

Activity 10.6 SECURITY AND SOCIETY

Activities are of a cross-cutting nature and should be conducted by interacting between natural sciences, technology and other sciences, in particular political, social and human sciences. The focus will be on targeted cultural and socio-economic, as well as systemic risk
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analyses, scenario building and other research activities related to subjects such as: Security as an evolving concept (comprehensive analyses of security-related needs, in order to define the main functional requirements to address the fluctuating security landscape); interdependencies, vulnerabilities due to disasters and new threats (e.g. in the field of terrorism and organised crime); the attitude of citizens in crisis situations (e.g. perception of terrorism and crime, behaviour of crowds, public understanding of civil rights and socio-cultural forms of protection and acceptance of security (and safety) controls); preparedness and readiness of the citizen in case of terrorist attacks; issues related to communication between authorities and citizens in crisis situations; raising public awareness for threats; citizens' guidance on the internal security advisory and assistance systems in the Member States and at EU level; behavioural, psychological and other relevant analyses of terrorist offenders; ethical issues with respect to personal data protection and integrity of information. Research will also be directed into developing statistical indicators on crime to permit assessments of changes in criminality.

Security, whilst very important, is just one of the societal values in Europe which must be balanced against others. It is a tool in support of freedom and can only be achieved within the rule of law. The EU Member States have all signed up to the European Convention on Human Rights and the EU's Charter of Fundamental Rights has become legally binding. The EU and its Member States are bound to respect and to promote human dignity, freedom, democracy, equality, the rule of law and protection of fundamental rights (which include the rights to privacy and data protection, freedom of expression and association, good governance and security).

In this activity, the objective is to carry out research into all those political, social and human factors that influence European security solutions and related new technologies, and to specify how the proposed security solutions must be adaptable to diverse cultural and institutional settings.

Actions in this activity will provide improved insight and advice for security policy makers, security research programme makers and (mission oriented) security research performers and civil society organisations. They aim to obtain a broad and well-based understanding of the public administrative, cultural and societal frameworks in which security enhancing policy measures, including in particular security research, take place. In particular they bring about in-depth understanding of the mutual dependency of technology, organisational dynamics, human factors, societal issues as well as related legal aspects. The outcome of the research together with appropriate dissemination strategies contribute to the effective and efficient planning and designing of future security research programmes and actions as well as to policies, programmes and initiatives which enhance the security of the European citizens.

As this activity takes a mission-oriented approach, it is complementary to the more general approach of Theme 8 *Socio-Economic Sciences and the Humanities (SSH)*, of the Cooperation Programme, as well as to the *Science and Society* area of the Capacities Programme. The objective of the Socio-Economic Sciences and the Humanities is to generate in-depth, shared understanding of complex and interrelated socio-economic challenges in Europe. Human security and international security are addressed as one of these challenges and set in the general landscape.

Science and Society has the objective to stimulate, with a view to building an open, effective and democratic European knowledge-based society, the harmonious integration of scientific

and technological endeavour, and associated research policies in the European social web by encouraging pan-European reflection and debate on science and technology and their relationship with the whole spectrum of society and culture. In that context, ethics in science and technology is addressed.

The security and society activity in the Security theme is targeted towards security challenges and addresses immediate and medium term issues in relation to societal impacts.

Coordination between these activities takes place on a regular basis in order to ensure synergy and take advantage of the available knowledge.

This activity is divided among five areas: **Citizens, media and security; Organisational requirements for interoperability; Foresight, scenarios and security as an evolving concept; Security economics; Ethics and Justice.**

Area 10.6.1 Citizens, media and security

Research in this area will ensure that selected policies and technologies are responsive to the needs of the citizens, and that they create security approaches that are rooted and acceptable by society and citizens, with differing cultural backgrounds. It will also support political accountability and democratic control aspects of public services within the security arena.

Topic SEC-2013.6.1-1 The impact of social media in emergencies – Capability Project

Description of topic:

The impact of social media in emergencies and their impact on public feelings of security and insecurity are poorly understood. Research is needed on various facets of the growing importance of social media in situations of societal emergencies or when facing threats to citizen security as in civil protection situations.

Social media play a crucial role in any event locally, nationally and internationally. There is little systematic research based knowledge about what role they play in emergency situations. Social media are also vehicles for story telling and rumour spreading of vast proportions in disasters with many uncertainties and complex interactions. Research is therefore needed on the consequences of the new pattern that social media may very quickly provide information (reliable or unreliable) on fast moving developments.

Research may focus on the following issues:

- How and when do social media contribute to the general understanding of what has happened, the reasons why it has happened?
- How do people react, what might be the consequences, what reactions are/should be chosen by the authorities?
- Under what circumstances do the social media play a social responsible role or an irresponsible role that aggravates the critical situation?
- What is the difference between the different types of social media?

Social media becomes a complicating influence in crises unless new tools and methods are developed to meet this challenge. New tools which can be applied in different scenarios are also needed to reduce potential information overload among incident commanders.

Involvement of social network providers is encouraged. Proposers for this topic should also look for an enhanced SME participation as described in Part 1 of the work programme.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

Stakeholders should get a better understanding of the impact of social media before, during and after emergencies, as this new dimension adds uncertainty and complexity. This research should lead to better emergency management systems and crisis management tools in terms of information gathering, information filtering, intelligence extraction and incident identification applied in different scenarios.

Topic SEC-2013.6.1-2 Varying forms of terrorism – Capability Project

Description of topic:

Research on terrorism and violent radicalisation process and violence promoting extremism has tended to concentrate on groups of people with specific attitude and action patterns. We know less about what social, educational and cultural and psychological factors and attitudes that may lead to individual fascinations with extreme violent ideas, and what would bring a single person from ideas to action. We also have limited knowledge about how such a potentially violent situation can be uncovered, hindered, mitigated, anticipated and prevented. There is also a lack of information on the main stages radicalised people go through and their timeframe. We must assume that answers to these highly complex questions will change over time and across contexts given the impacts of globalisation, rapidly advancing social media, and other relevant trends.

Furthermore, Europe has experienced forms of right wing, left wing and anarchist violent extremism and terrorism that warrant closer analysis and understanding.

Research may focus on the following issues:

Radicalisation Processes and Paths – ideas and actions

- What are the psychological and social processes of radicalisation that lead to someone becoming committed to violent extremism?
- What can be learnt about the people involved in a radicalisation process?
- What are the stages of their radicalisation process?
- What are the processes and stages of self-radicalisation that lead to a solo person committed to acts of violent extremism?
- What relationship is there between radicalisation processes and violent ideologies, methods, intentions and targets?
- What would bring a person from extreme violent ideas to violent action?

Influencing Factors (or Root Causes)

What factors increase or decrease the risks of individual or group radicalisation and of self-radicalisation? For example, the role of:

- upbringing, school;
- family and social environment;
- psychosocial factors (including group dynamics);
- religion and ideology;

- the internet and social media;
- easy access to weapons and explosives;
- socio-economic factors; and
- political and legal factors.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

The research will help in identifying root causes, and counter measures to assist the work of national authorities as well as local communities, and to strengthen the societal resilience.

National and local communities can better prevent, prepare for and protect themselves against such varying forms of deadly violence. For example:

- New equipments and systems can support these objectives.
- Practices, processes, procedures and methodologies can be improved for the benefit of the citizen.
- Authorities can better manage information and communication with the public.

The research and the usable results should consider fundamental rights protection, comparative studies of international laws, ethical and societal impacts, in particular with relevance to EU anti-terrorism policies.

Topic SEC-2013.6.1-3 Trafficking in Human Beings: analysis of criminal networks for more effective counter-trafficking – Coordination and Support Action (Supporting Action)

Description of topic:

Trafficking in human beings (THB) is one of the largest criminal industries in the world. While research on this phenomenon has increased in recent years, to date the focus has been primarily on victims and survivors of the crime and little is known about the perpetrators.

Serious efforts in addressing THB require a clear understanding of current trends not only in regards to victims, but also regarding traffickers, trafficking networks, their modus operandi, their travel routes and the different forms of THB committed by them. To develop effective strategies to combat the crime of human trafficking, it is necessary to better understand the organisational structure of those participating in the trafficking business.

Offenders quickly adapt and improve their techniques, routes and methods in response to law enforcement strategies against THB. The clandestine nature of activities and the use of illegal channels are increasingly prevalent features. Members of the trafficking organisations are located in origin, transit and destination countries; therefore they can easily react to new market situations. For effective counter-trafficking policies and activities, it is imperative to equip relevant actors with detailed and up-to-date information.

The project should include at least the active participation of one authority officially in charge of addressing trafficking in human beings at the national or European level.

Funding schemes: Coordination and Support Action (Supporting Action)

Expected impact:

Increased information on offenders is anticipated to contribute to better identification of vulnerable groups in danger of being trafficked. It is a real challenge to know how to deal with those who become part of trafficking networks, who sometimes may have been in the first place victims themselves. Understanding the structure and nature of social relationships within trafficking organisations is expected to provide stakeholders with important information to combat/prevent the recruitment of victims through other victims and to disrupt the business of trafficking.

Research actions to be conducted should be complementary to on-going EU and national projects and activities (e.g. CAPER, activities of the SSH theme, EUROPOL, etc.).

Area 10.6.2 Organisational requirement for interoperability of public users

An objective European joint security capability to handle security matters has to be based upon the resources and mandates of the Member States and Associated Countries. The distinct national systems must be interoperable, scalable and allow for mobility where appropriate. Research under this area will look at the organisational structures, behavioural and cultural issues of end user organisations in order to ensure applicability, user friendliness and affordability of security technologies and solutions. Fulfilment of the ambitions of the Solidarity Clause of the Lisbon Treaty and implementation of the Internal Security Strategy require such organisational and cultural compatibility across Member States.

Topic SEC-2013.6.2-1 Facilitators for assistance among EU Member States in emergencies in the EU – Capability Project or Coordination and Support Action (Coordinating Action)**Description of topic:**

The Solidarity Clause of the Lisbon Treaty suggests ambitious objectives for mutual assistance among EU Member States in emergencies in European territory. The organisational structures and cultures of public agencies responsible for such mutual assistance efforts need to be prepared to provide and to receive such assistance from other Member States – EU Host Nation Support Guidelines should be taken into account. Research is needed on the organisational components and process elements that may facilitate or hinder such compatibility among the responsible agencies and supporting actors in cooperating Member States. Such joint arrangements must be cost effective and usable. They must also be acceptable to engage stakeholders, including supporting actors, such as businesses and civil organisations. Without better knowledge about institutional arrangements and organisational cultures affecting such efforts, these will not become effective in support of citizen security.

Funding schemes: Collaborative Project (small or medium-scale focused research project) or Coordination and Support Action (Coordinating Action)

Expected impact:

The new knowledge and/or technologies will serve as input in the design of new arrangements to deal with mutual assistance in future emergencies in the EU. The coherence and effectiveness of European actions will be strengthened.

Area 10.6.3 Foresight, scenarios and security as evolving concept

Research under this area will improve our understanding of novel threats as well as technological opportunities and emerging security related ethical, cultural and organisational challenges. It will help authorities to assess investment alternatives for prevention, early warning or preparedness and to make the appropriate choices in addressing threats to public security that achieve social cohesion and fully respect fundamental rights, in particular the protection of personal data.

Security is a concept with many interpretations. Research is needed on the various meanings, perceptions and practices of security in the Union. Europe's security needs do not only rise and fall in relation to concrete threats. They change as a result of technological advances and social evolution. How does European security research in fact contribute to the real and the sensed enhancement of security for the citizens?

Topic SEC-2013.6.3-1 Horizon scanning and foresight for security research and innovation – Coordination and Support Action (Coordinating Action)

Description of topic:

Up to now a considerable number of security related foresight activities have been funded in the FP 7 security theme. It is therefore timely to draw upon the results of these, and to develop a consistent 'horizon scanning' in security to deal with expectations about future developments in a rational manner. Foresights studies produce expectations about mid-term and long-term trends, while scanning can also look at short-term evidence for emerging risks. These expectations tend to change accidentally, caused by external events. So for reliable long-term trend analysis it is also necessary to understand the dynamics in these changes.

Horizon scanning and foresight activities will address social needs, as well as scientific capabilities and technical solutions. For each scanning activity different sources need to be included. The mapping of existing security related foresight studies and internet data in general can be used for both activities.

Transparent, public knowledge about long-term trends and drivers is very important for the efficiency of the European security research innovation system. Each stakeholder has its own expectation about future trends and behaves in accordance to this expectation. Misleading expectation can cause wrong investments, wrong political strategies or other expensive mistakes. To have reliable information about future social needs and possible technological solutions is a win-win situation for all stakeholders of the security innovation system.

It is important to link process models of the impacts of identified risks to decision support frameworks so as to ensure evidence based decision making.

Proposers are strongly encouraged to develop solutions in compliance with European societal values, including privacy issues and fundamental rights.

The visibility and the take up of security research results at stakeholder level, especially focusing on the end users, still have to be improved.

Research activities to be conducted should draw upon results of and be complementary to FP7 and national activities funded in this area (such as the projects SIAM, DESSI, FORESEC, FOCUS, FESTOS and ETTIS).

Funding schemes: Coordination and Support Action (Coordinating Action)

Expected impact:

The results should provide more effective information into foresight for political agenda setting and also provide a better understanding of the new and upcoming technologies and long-term trends, leading to the strategic planning into security issues of relevant stakeholders.

Topic SEC-2013.6.3-2 The evolving concept of security – Coordination and Support Action (Coordinating Action)

Description of topic:

Security is a concept with many interpretations. Yet, it is a core element in the common aim to build a more secure Union, as envisioned in the Internal Security Strategy. Research is needed on the various meanings, perceptions, legal comparative laws, and practices of security in the Union. Europe's security needs do not only rise and fall in relation to concrete threats. They change as a result of technological advances and social evolution.

Security is a concept that is used about many types of situations and can be seen as a given, but in reality it varies a lot according to the situation, the persons, the experience, age and gender. Its meaning may be provoked or eased by media, by surveillance, police and by legal factors.

Research in this area will document and analyse the evolution of security thinking and practices as the result of multiple factors: social values, technological innovation, politics, legal, economics, etc. This will contribute to a more complete understanding of the pros and cons of measures to take in order to enhance Europe's security.

Research activities to be conducted should draw upon results of and be complementary to previous FP7 and national activities funded in this area.

Funding schemes: Coordination and Support Action (Coordinating Action)

Expected impact:

Both perceptions of threat and the measures that are taken are directly influenced by a shared concept of security. The evolution of the concept can be expected to have a direct impact on both of these areas. Proposals should directly address these challenges. Among potential impacts of the research should be changes in the working parameters of various types of security end-users. How does the evolution in the concept of security impact the way police, border guards, first-responders, social services, NGOs and others do their work, understand threat, and assess the risks connected to their work.

Area 10.6.4 Security economics

No specific topic for this area has been planned for this call.

Area 10.6.5 Ethics and justice

Security technologies and policies raise various ethical and legal concerns, which influence public support and acceptance. Research under this area will address the privacy, data protection and human rights issues as well as acceptability, ethical and prioritisation issues,

while taking into account a variety of approaches to ethical, social and legal questions based on divergent ethical, religious, historical and philosophical backgrounds. Aspects of social exclusion, lack of social cohesion that may lead to the formation of areas of insecurity within Europe may also be considered, as well as aspects of the European Neighbourhood Policy relevant to security. This will contribute to the general discussion and help both security solution suppliers as well as end users to make better decisions when selecting and applying security technologies and solutions.

Topic SEC-2013.6.5-1 Synthesis of results and reviewing of ethics, legal and justice activities in Security research in FP7 – Coordination and Support Action (Coordinating Action)

Description of topic:

The action will define the strategic roadmap required for future research projects in the area of ethics and justice. This roadmapping activity should take into account relevant completed and ongoing work (notably projects in this area such as PRISMS, SURPRISE, DETECTER, INEX, SMART, SAPIENT, ADDPRIV). It shall lay out in a coherent and clear manner the further research work required. It will assess the relevant factual and political situation and trends.

Funding schemes: Coordination and Support Action (Coordinating Action)

Expected impact:

The action will provide a solid basis for sequencing and describing research tasks to be called for in the future.

Activity 10.7 SECURITY RESEARCH COORDINATION AND STRUCTURING

<p>This area provides the platform for activities to coordinate and structure national, European and international security research efforts, to develop synergies between civil, security and defence research as well as to coordinate between the demand and the supply side of security research. Activities will also focus on the improvement of relevant legal conditions and procedures.</p>
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The Security theme, aiming at increasing the security for Europe's citizens and simultaneously improving the global competitiveness of Europe's industrial base, needs to utilise limited resources in an effective and efficient manner. It is embedded in a fabric of other relevant research work carried out under various other programmes both on the European level as well as in the Member States and Associated Countries. It can only reach its objective, if its outcome is eventually applied by the relevant end user communities.

It is understood however, that there will be certain areas where coordination and structuring are not sought, or needed, but equally there will be others where coordination and even co-operation would add value.

Actions in this activity will provide deeper insight and wider awareness of the European security related research and industrial landscape and the public environments and frameworks in which stakeholders operate. In particular actions will indicate opportunities and constraints for developing and strengthening a European security related market. Actions

will ensure enhanced networking, coordination and co-operation of Member States and Associated Countries as well as between relevant organisations at the European level. All this will contribute to the overall impact of the Security theme by making it more effective and efficient, will raise the innovation level in the security domain and will achieve increasingly harmonised implementation approaches.

This activity is divided in six areas: **ERA-net; Small and Medium Enterprises; Studies; Other coordination; End-users; and Training.**

Area 10.7.1 ERA-net

No specific topic for this area has been planned for this call.

Area 10.7.2 Small and Medium Enterprises

Topic SEC-2013.7.2-1 Open topic for Small and Medium Enterprises: “Solutions for frequent petty crimes that are of high impact to local communities and citizens” – Capability Project

Description:

This specific open topic aims at improving security in local communities and for citizens.

Work funded under this topic should address insecurities towards local communities (citizens and businesses). Crime such as theft, extortion, fraud, etc poses a serious threat to their well being. High crime rates negatively impact the surrounding commercial and social environment which makes communities less resilient and less likely to receive inward investment. Existing communities do not prosper and are reluctant to expand resulting in a downward spiral.

Furthermore, work funded under this topic should identify and then look into solutions for frequent but low-intensity sources of insecurity that nevertheless have high impact on communities and citizens.

Project(s) to be funded are expected to be innovative research and development work, leading to low cost technology based solutions, meeting the needs and financial expectations of 1) the communities and 2) citizens. The cost to benefit ratio of the proposed solution should be analysed against the impact of the threats.

Indicative research areas could be for instance:

1. to develop new technologies/methods to protect local business and/or citizens from theft and/or extortion and/or fraud;
2. to develop new technologies/methods for the general protection of citizens from physical violence;
3. to develop a technology method for the general protection of private and public properties against vandalism (e.g. train/subway stations, facades/walls, cars, etc.); and
4. any other field relevant for frequent in-security situations that are of high impact to local community businesses and citizens.

This open topic should lead to projects that have strong SME participation / consortia that are led by SMEs. Projects may also support the acquisition of technologies / knowledge needed for SMEs, thus bringing together SMEs with the researcher community that are typically out of the reach of SMEs. Accordingly this Topic should help SMEs providing real solutions for real issues.

For each project/consortium, the following recommendations apply:

- at least 50% of the EU funding should go to eligible SMEs;
- small-sized projects are encouraged (up to € 1.5 million EC Funding);
- the project duration should be up to 2 years;
- small consortia (3-7 partners) are encouraged;
- SME coordinators are encouraged but they are by no means mandatory – lack of prior FP7 experience should not be seen as a handicap for an SME coordinator; and
- at least one end-user should be included in the consortium.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected Impact: It is expected that innovative low cost solutions will be developed that reduce crime against local communities, businesses and citizens. Thereby the project(s) should be leading to demonstrable positive impacts. These solutions should offer the prospect of export of goods/services from the EU to global markets.

Area 10.7.3 Studies

Topic SEC-2013.7.3-1 Increasing the engagement of civil society in security research – Coordination and Support Action (Supporting Action)

Description of topic:

Security research engages many different stakeholders. There is a need to increase the engagement of representatives of or advocates for civil society in security research. A study is needed on how and where these organisations participate already in research activities, and what measures to increase their participation already exist elsewhere in FP7. A strategy should also be developed with concrete action steps how to increase their participation in both the shaping and the implementation of civil security research. Also, steps should be considered on how to ensure a greater understanding among civil society organisations of the potential benefits, especially with regard to societal security, of the results coming from security research activities.

Funding schemes: Coordination and Support Action (Supporting action)

Expected impact:

The outcomes should include an action plan which will help achieving a greater engagement with and involvement of civil society organisations and their advocates in EU security research in the future.

Area 10.7.4 Other coordination

Topic SEC-2013.7.4-1 Trans-national cooperation among public security research stakeholders – Coordination and Support Action (Coordinating Action)

Description of topic:

The aim of the topic is to improve coordination at European level of various national or regional networks in different security research domains (for example law enforcement, forensics, airport security, etc). Activities can concentrate on a specific core area or cover several areas.

The action should further aim to: a) exchange information on security issues in their countries and define core areas of common interest in order to prevent duplication and identify synergies, b) exchange information about research needs and latest technological developments, c) develop common strategies and mechanisms in the specific area(s), and d) explore possibilities for coordinated and/or joint activities.

Funding schemes: Coordination and Support Action (Coordinating action)

Expected impact:

It is expected to improve networking and coordination of various national/regional activities relevant to Security research at European level.

Area 10.7.5 End-users

No specific topic for this area has been planned for this call.

Area 10.7.6 Training

Topic SEC-2013.7.6-1 Open topic for Small and Medium Enterprises: “Use of serious gaming in order to improve intelligence analysis by law enforcement agents” – Capability Project

Description of topic:

The quality of intelligence analysis depends on the analysts' skills; even though training programmes have progressed supported by e-learning, there is still room to improve the creative, reasoning skills and reflexes of the law enforcement agents. The objective is to develop gaming solutions that address the requirements of the civil security intelligence analysis community.

Research is required in two stages:

- First, to capture the way analysts have to think, using both deduction and induction, and exploiting fully their skills, knowledge, experience and creativity. The ideal analyst uses both rigorous analysis and attention to process and detail, and also imagination and the willingness and ability to make inspired guesses.
- Second, research must develop new approaches on how technology can support training and development. This stage must consider the psychological, behavioural, technical and

pedagogical issues in order to develop innovative training approaches, processes, procedures and methodologies.

For each project/consortium, the following recommendations apply:

- at least 50% of the EU funding should go to eligible SMEs;
- small-sized projects are encouraged (up to € 1.5 million EC Funding);
- the project duration should be up to 2 years;
- small consortia (3-7 partners) are encouraged;
- SME coordinators are encouraged but they are by no means mandatory – lack of prior FP7 experience should not be seen as a handicap for an SME coordinator; and
- at least one end-user should be included in the consortium.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact:

The objective is to develop solutions that address the requirements of the civil security intelligence analysis community. Research should go beyond E-learning and already existing virtual classroom. It is also expected that through this topic SMEs will play a more active role in the development of new innovative technologies or services in the serious gaming area.

III. IMPLEMENTATION OF CALLS

For description of the topics of the calls, please refer to section II 'Content of calls'

FP7-SEC-2013-1

- **Call identifier:** FP7-SEC-2013-1
- **Date of publication:** 10/July/2012⁵⁵
- **Deadline:** 22/November/2012 at 17.00.00, Brussels local time⁵⁶
- **Indicative budget:** EUR 299.33million⁵⁷

The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- An indicative 45% (deviation possible from 35% to 65%) of the budget for topics to be implemented through Integration Projects and Demonstration Projects Phase II (large scale integrating projects).
- An indicative 6% (deviation possible from 0% to 10%) for Pre-Operational-Validation topic 3.2-1 and for Pre-Operational-Validation topic 5.3-2.
- An indicative 49% (deviation possible from 39% to 69%) of the budget for the other topics (small or medium-scale focused research project and coordination and support actions).
- Within the above indicated limits, up to 5% can be used for the open topics for SMEs 7.2-1 and 7.6-1.
- Within the above indicative limits, up to 1% can be used for international cooperation partners within selected projects.
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

⁵⁵ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁵⁶ The Director-General responsible may delay this deadline by up to two months.

⁵⁷ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

- **Topics called:**

Activity/ Area	Topics called	Funding Schemes
Activity 10.1 Security of citizens		
Area: 10.1.1 Organised crime	Topic SEC-2013.1.1-1 Serious organised economic crime	CP-IP
	Topic SEC-2013.1.1-2 “Stronger Identity for EU citizens”	CP-FP
Area: 10.1.2 Intelligence against terrorism	none	none
Area: 10.1.3 Explosives	Topic SEC-2013.1.3-1 Inhibiting the use of explosives precursors	CP-FP
Area: 10.1.4 Ordinary crime and forensics	Topic SEC-2013.1.4-1 Smart and protective clothing for law enforcement and first responders	CP-FP
	Topic SEC-2013.1.4-2 Development of a Common European Framework for the application of new technologies in the collection and use of evidence	CSA (Supporting Action)
Area: 10.1.5 CBRN protection	Topic SEC-2013.1.5-1 European toolbox, focusing on procedures, practices and guidelines for CBRN forensic aspects	CP-FP
Area: 10.1.6 Information gathering	Topic SEC-2013.1.6-1 Framework and tools for (semi-) automated exploitation of massive amounts of digital data for forensic purposes	CP-IP
	Topic SEC-2013.1.6-2 Novel technologies and management solutions for protection of crowds	CP-IP
	Topic SEC-2013-1.6-3 Surveillance of wide zones: from detection to alert	CP-IP
	Topic SEC-2013-1.6-4 Information Exploitation	CP-IP
Activity: 10.2 Security of infrastructures and utilities		
Area: 10.2.1 Design, planning of buildings and urban areas	Topic SEC-2013.2.1-1 Evidence based and integral security concepts for government asset protection	CP-FP
	Topic SEC-2013.2.1-2 Impact of extreme weather on critical infrastructure	CP-FP
Area: 10.2.2 Energy, transport, communication grids	Topic SEC-2013.2.2-1 A research agenda for security issues on land transport	CSA (Coordinating Action)

	Topic SEC-2013.2.2-2 Toolbox for pandemics or highly dangerous pathogens in transport hubs – Capability Project	CP-FP
	Topic SEC-2013.2.2-3 Protection of smart energy grids against cyber attacks	CP-FP
	Topic SEC-2013.2.2-4 Cost effectiveness of security measures applied to renewable/distributed energy production and distribution	CP-FP
	Topic SEC-2013.2.2-5 Security of ground based infrastructure and assets operating space systems	CP-FP
Area: 10.2.3 Surveillance	none	none
Area: 10.2.4 Supply chain	Topic SEC-2013.2.4-1 Phase II demonstration programme on logistics and supply chain security	CP-IP
	Topic SEC-2013.2.4-2 Non-military protection measures for merchant shipping against piracy	CP-FP or Coordination and Support Action (Coordinating Action)
Area: 10.2.5 Cyber crime	Topic SEC-2013.2.5-1 Developing a Cyber crime and cyber terrorism research agenda	CSA (Coordinating Action)
	Topic SEC-2013.2.5-2 Understanding the economic impacts of Cyber crime in non-ICT sectors across jurisdictions	CP-FP
	Topic SEC-2013.2.5-3 Pan European detection and management of incidents/attacks on critical infrastructures in sectors other than the ICT sector (i.e. energy, transport, finance, etc)	CP-IP
	Topic SEC-2013.2.5-4 Protection systems for utility networks	CP-FP
Activity: 10.3 Intelligent surveillance and border security		
Area: 10.3.1 Sea borders	none	none
Area: 10.3.2 Land borders	Topic SEC-2013.3.2-1 Pre-Operational Validation (POV) on land borders	CP-CSA
	Topic SEC-2013.3.2-2 Sensor technology for under foliage detection	CP-IP
	Topic SEC-2013.3.2-3 Mobile equipment at the land border crossing points	CP-FP
Area: 10.3.3 Air borders	none	none

Area: 10.3.4 Border checks	Topic SEC-2013.3.4-1 Border checkpoints - hidden human detection	CP-FP
	Topic SEC-2013.3.4-2 Extended border security - passport breeder document security	CSA (Supporting Action)
	Topic SEC-2013.3.4-3 Security checks versus risk at borders	CP-FP
Area: 10.3.5 Intelligent border surveillance	none	none
Activity: 10.4 Restoring security and safety in case of crisis		
Area: 10.4.1 Preparedness, prevention, mitigation and planning	Topic SEC-2013.4.1-1 Phase II demonstration programme on aftermath crisis management	CP-IP
	Topic SEC-2013.4.1-2 Better understanding of the cascading effect in crisis situations in order to improve future response and preparedness and contribute to lower damages and other unfortunate consequences	CP-FP
	Topic SEC-2013.4.1-3 Development of simulation models and tools for optimising the pre-deployment and deployment of resources and the supply chain in external emergency situations	CP-FP
	Topic SEC-2013.4.1-4 Development of decision support tools for improving preparedness and response of Health Services involved in emergency situations	CP-FP
	Topic SEC-2013.4.1-5 Preparing societies to cope with large scale and/or cross border crisis and disasters	CSA (Supporting Action)
	Topic SEC-2013.4.1-6 Preparedness for and management of large scale forest fires	CP-IP
Area: 10.4.2 Response	Topic SEC-2013.4.2-1 Fast rescue of disaster surviving victims: Simulation of and situation awareness during structural collapses including detection of survivors and survival spaces	CP-IP
Area: 10.4.3 Recovery	Topic SEC-2013.4.3-1 Shaping immediate relief action in line with the goals of development co-operation in post crisis / post conflict societies to maintain stability	CP-FP
Area: 10.4.4 CBRN response	Topic SEC-2013.4.4-1 Tools for detection, traceability, triage and individual monitoring of victims after a mass CBRN contamination	CP-IP
Activity: 10.5 Security systems integration, interconnectivity and interoperability		

Area: 10.5.1 Information management	Topic SEC-2013.5.1-1 Analysis and identification of security systems and data set used by first responders and police authorities	CP-FP
	Topic SEC-2013.5.1-2 Audio and voice analysis, speaker identification for security applications	CP-IP
Area: 10.5.2 Secure communications	none	none
Area: 10.5.3 Interoperability	Topic SEC-2013.5.3-1 Definition of interoperability specifications for information and meta-data exchange amongst sensors and control systems	CP-FP
	Topic SEC-2013.5.3-2 Testing the interoperability of maritime surveillance systems	CP-CSA
Area: 10.5.4 Standardisation	Topic SEC-2013.5.4-1 Evaluation and certification schemes for security products	CP-FP
Activity: 10.6 Security and society		
Area: 10.6.1 Citizens, media and security	Topic SEC-2013.6.1-1 The impact of social media in emergencies	CP-FP
	Topic SEC-2013.6.1-2 Varying forms of terrorism	CP-FP
	Topic SEC-2013.6.1-3 Trafficking in Human Beings: analysis of criminal networks for more effective counter-trafficking	CSA (Supporting Action)
Area: 10.6.2 Organisational requirements for interoperability of public users	Topic SEC-2013.6.2-1 Facilitators for assistance among EU Member States in emergencies in the EU	CP-FP or CSA (Coordinating Action)
Area: 10.6.3 Foresight, scenarios and security as evolving concept	Topic SEC-2013.6.3-1 Horizon scanning and foresight for security research and innovation	CSA (Coordinating Action)
	Topic SEC-2013.6.3-2 The evolving concept of security	CSA (Coordinating Action)
Area: 10.6.4 Security economics	none	none
Area: 10.6.5 Ethics and justice	Topic SEC-2013.6.5-1 Synthesis of results and reviewing of ethics, legal and justice activities in Security research in FP7	CSA (Coordinating Action)
Activity: 10.7 Security Research coordination and structuring		
Area: 10.7.1 ERA-net	none	none

Area: 10.7.2 Small and Medium Enterprises	Topic SEC-2013.7.2-1 Open topic for Small and Medium Enterprises: "Solutions for frequent petty crimes that are of high impact to local communities and citizens"	CP-FP
Area: 10.7.3 Studies	Topic SEC-2013.7.3-1 Increasing the engagement of civil society in security research	CSA (Supporting Action)
Area: 10.7.4 Other coordination	Topic SEC-2013.7.4-1 Trans-national cooperation among public security research stakeholders	CSA (Coordinating Action)
Area: 10.7.5 End- users	none	none
Area: 10.7.6 Training	Topic SEC-2013.7.6-1 Open topic for Small and Medium Enterprises: "Use of serious gaming in order to improve intelligence analysis by law enforcement agents"	CP-FP

• **Eligibility conditions:**

- The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Funding scheme	Minimum conditions
Collaborative Projects	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (coordinating action)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions (supporting action)	At least 1 independent legal entity.

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.
- Proposals containing any classified information shall be ineligible.

Additional eligibility criterion:

Topics SEC-2013.3.2-1 and SEC-2013.5.3-2 will require the participation of at least 3 independent public authorities (at either local, regional, national or supra-national level) no 2 of which are established in the same MS or AC (documents proving the status of the participant have to be provided).

• **Evaluation criteria for evaluating POV proposals**

1. Scientific and/or technological excellence

- Progress beyond the state-of-the-art.
- Quality and effectiveness of the S/T methodology and associated strategy and work plan.

2. Quality and efficiency of the implementation and the management

- Quality of the consortium as a whole (including complementarity, balance).
- Commitment of participating authorities.
- Appropriateness of the allocation and justification of the resources to be committed (staff, equipment,...).

3. The potential impact through the development, dissemination and use of project results

- Appropriateness of measures for the dissemination and/or exploitation of project results, and management of intellectual property.

• **Evaluation procedure:**

- The evaluation criteria and scoring scheme are set out in annex 2 of the work programme.
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission .

The Commission may instruct the experts to disregard any pages exceeding these limits.

The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).

- A one-stage submission and evaluation procedure will be used.
- Experts will carry out the individual evaluation of proposals remotely.
- The procedure for prioritising proposals with equal scores is described in annex 2 of the work programme.

- **Particular requirement for participation, evaluation and implementation:**

Classified Information

Proposals must not contain any *classified information* (note that the proposed action itself *can* involve classified information). If classified inputs are required to carry out a proposed action or the output of the action needs to be classified, proposers have to ensure the following:

- provide evidence of the clearance of all relevant facilities;
- clarify issues such as e.g. access to classified information or export or transfer control with the National Security Authorities (NSA) of their Member States / Associated Countries, and provide evidence of the prior agreement of their NSAs;
- provide a Security Aspect Letter (SAL), indicating the levels of classification required at deliverables/partners level.

Absence of any of these elements may lead the Commission to decide not to proceed to negotiation of a grant agreement even if the proposal is evaluated positively. Furthermore, appropriate arrangements have to be included in the consortium agreement.

If the proposal is evaluated positively and invited for the negotiation, a definitive version of the SAL and of the SCG will be annexed to the Description of Work and must be worked out during negotiations. Special clauses will be introduced in the Grant Agreement. National security authorities will be consulted after the evaluation and before the negotiation through their representatives in the Security Assessment ad-hoc group from the Security Programme Committee. They will have the possibility to make recommendations regarding 'classified information' issues to be taken into account during the negotiation.

For projects based on proposals which did not contain SAL but that have been subject to security recommendations following the above procedure, a SAL and its SCG annex could be required during the negotiations.

Ethical Review

Proposed activities shall be carried out in compliance with fundamental ethical principles. If ethical issues, including privacy are raised, they should be addressed in the core of the proposed activity. In addition, the potential impact of the resulting technologies and activities on Fundamental Rights, ethical principles and societal values should be addressed as part of the proposed research.

Small and Medium Enterprises (SME) and end-users

Consortia are strongly encouraged to actively involve *SMEs and end-users*.

Evaluation

The *evaluation criteria* (including weights and thresholds) and sub-criteria, together with the eligibility, selection and award criteria for the different funding schemes are set out in Annex 2 to this work programme.

Coordinators of all integration project proposals and of all demonstration projects (phase II) proposals that pass all the evaluation thresholds may be invited to a *hearing*.

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

Positively evaluated proposals involving sensitive and classified information, those involving international co-operation as well as those collaborative projects where 75% funding for all participants is foreseen will be flagged to the members of the *Security Programme Committee* configuration and dealt with according to its Rules for Procedure.

- **Indicative timetable:** This call in 2012 invites proposals to be funded in 2013. Evaluation of proposals is foreseen to be carried out in January/February 2013. It is expected that the grant agreement negotiations for the short listed proposals will be opened in the first half of 2013.
- **Consortia agreements** are required for *all* action.
- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

Proposers claiming that their proposal should receive EU funding for research activities up to 75% for specific reasons as described on page 10 of this document should demonstrate in the proposal that the exceptional required conditions apply.

- **Flat rates to cover subsistence costs:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: https://ec.europa.eu/research/participants/portal/page/fp7_documents under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances.

IV. OTHER ACTIONS⁵⁸ (not implemented through calls for proposals)

In addition to the above schemes and call for proposals, the following actions will be supported:

- **Call for tender⁵⁹ ⁶⁰: Electronic tools allowing the secured exchange of EU RESTREINT classified information**

This action will be launched in the third trimester of 2013. Due to the possibility of managing classified reports in the context of a given project, there is a need for tools that could allow exchange of EU RESTREINT information via standard e-mail tools. The European Commission is willing to support the EU accreditation process of such a tool, which could be an existing one or a newly developed for this particular use. Open source solutions are welcome.

Indicative Budget: up to EUR 1 000 000.⁶¹

Funding scheme: Coordination and Support Action - public procurement

Expected Impact: Facilitate the management of EU RESTREINT research projects

- **Call for tender⁶² ⁶³: Development of statistical data on the European Security and Technological Industrial Base**

This action in the second semester of 2013 aims at developing statistical data that would allow to obtain a clearer picture of the technological industrial base of the security industry in Europe. This would allow to obtain a better understanding of the strengths and weaknesses of the European security industry, as well as to better monitor the impact of R&D activities on the European security industry.

As of today no reliable statistical data exists on the European security industry. The security industry is not covered as such by the main statistical nomenclatures (NACE, Prodcom, etc.). The production of security-related items is hidden under a wide range of industry and services headings. Statistics for these headings do not distinguish between security and non-security related activities.

Indicative Budget: up to EUR 750 000.⁶⁴

Funding scheme: Coordination and Support Action - public procurement

⁵⁸ In accordance with Articles 14, 17 and 27 of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

⁵⁹ Call for tender can also be attributed via a framework contract.

⁶⁰ Policy related action: the management of any resulting contract(s) will *not* be externalised to the REA.

⁶¹ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

⁶² Call for tender can also be attributed via a framework contract.

⁶³ Policy related action: the management of any resulting contract(s) will *not* be externalised to the REA.

⁶⁴ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

Expected impact: A first compilation of statistical data on the European security industry

- The use of appointed **independent experts** for the evaluation of proposals, and as independent observers at these evaluation, and where appropriate, for the reviewing of running projects

Indicative Budget: up to EUR 2 100 000.⁶⁵

Funding scheme: Coordination and Support Action – expert appointment letters

- **Support to workshops, conferences, expert groups, communications activities or studies**

a) Organisation of an annual Security Research event. Four service contracts are planned to be concluded in the second semester of 2013, and existing Framework Contracts will be used for this purpose.

Indicative Budget: up to EUR 1 000 000.⁶⁶

Funding scheme: Support Action – framework contract

b) Support to workshops, expert groups, communications activities or studies
Workshops are planned to be organised on various topics to involve end-users, to support an expert group on societal issues, to prepare information and communication material etc.

Indicative Budget: up to EUR 900 000.⁶⁷

Funding scheme: Coordination and Support Action - public procurement, expert contracts

⁶⁵ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

⁶⁶ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

⁶⁷ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

V. BUDGET

Theme SECURITY - Indicative budget

Activities	2013 ⁶⁸ Budget EUR million ⁶⁹
Call FP7-SEC-2013-1	299.33
General activities (cf Annex 4) (details below)	2,54
Other actions: <ul style="list-style-type: none">• Evaluations (EUR 1.600 million)• Monitoring and reviews (EUR 0.500 million)• Actions implemented through public procurements and expert groups (EUR 3.650 million)	5.75
Estimated total budget	307.62

General activities - indicative budget

Activities	2013 ⁷⁰ Budget EUR million
CORDIS	0.397
Experts (Evaluation and reviewers)	0.005
EUREKA	0.020
COST	2.115
Total	2,537

All budgetary figures given in this work programme are indicative. The final budgets may vary following the evaluation of proposals.

The final budget awarded to actions implemented through calls for proposals may vary:

- The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

⁶⁸ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

⁶⁹ The Budget figures given in this table are rounded to two decimals points.

⁷⁰ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

For actions not implemented through calls for proposals:

- The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions;
- The final budget awarded for all other actions not implemented through calls for proposals may vary by up to 10% of the indicated budget for these actions.

WORK PROGRAMME 2013

COOPERATION

ANNEXES 1-5

ANNEX 1: LIST OF INTERNATIONAL COOPERATION PARTNER COUNTRIES

ANNEX 2: ELIGIBILITY AND EVALUATION CRITERIA FOR PROPOSALS

***ANNEX 3: FORMS OF GRANT AND MAXIMUM REIMBURSEMENT RATES FOR
PROJECTS FUNDED THROUGH THE COOPERATION WORK PROGRAMME***

ANNEX 4: GENERAL ACTIVITIES

ANNEX 5: RECOVERY PACKAGE – PUBLIC PRIVATE PARTNERSHIP INITIATIVES

(European Commission C(2011)4536 of 09 July 2012)

Annex 1: List of International Cooperation Partner Countries (ICPC)¹

ACP *

- AFRICAN

• Angola	LM
• Benin	L
• Botswana	UM
• Burkina-Faso	L
• Burundi	L
• Cameroon	LM
• Cape Verde	LM
• Central African Republic	L
• Chad	L
• Comoros	L
• Congo (Republic)	LM
• Congo (Democratic Rep.)	L
• Côte d'Ivoire	L
• Djibouti	LM
• Equatorial Guinea	UM
• Eritrea	L
• Ethiopia	L
• Gabon	UM
• Gambia	L
• Ghana	L
• Guinea	L
• Guinea-Bissau	L
• Kenya	L
• Lesotho	LM
• Liberia	L
• Madagascar	L
• Malawi	L
• Mali	L
• Mauritania	L
• Mauritius	UM
• Mozambique	L
• Namibia	LM
• Niger	L
• Nigeria	L
• Rwanda	L
• Sao Tome and Principe	L
• Senegal	L
• Seychelles	UM
• Sierra Leone	L
• Somalia	L
• South Africa ²	UM
• South Sudan	L
• Sudan	L
• Swaziland	LM

• Tanzania	L
• Togo	L
• Uganda	L
• Zambia	L
• Zimbabwe	L

- CARIBBEAN

• Barbados	UM
• Belize	UM
• Cuba	LM
• Dominica	UM
• Dominican Rep.	LM
• Grenada	UM
• Guyana	LM
• Haiti	L
• Jamaica	LM
• Saint Kitts and Nevis	UM
• Saint Lucia	UM
• Saint Vincent and the Grenadines	UM
• Suriname	LM
• Trinidad and Tobago	UM

- PACIFIC

• Cook Islands	UM
• Timor Leste	L
• Fiji	LM
• Kiribati	LM
• Marshall Islands	LM
• Micronesia, Federal States of	LM
• Nauru	UM
• Niue	UM
• Palau	UM
• Papua New Guinea	L
• Samoa	LM
• Solomon Islands	L
• Tonga	LM
• Tuvalu	LM
• Vanuatu	LM

ASIA

• Afghanistan	L
• Bangladesh	L
• Bhutan	L
• Burma/Myanmar	L
• Cambodia	L
• China ^{2**}	LM
• Democratic People's Republic of Korea	L
• India ^{2**}	L
• Indonesia	LM
• Iran	LM

• Iraq	LM
• Lao People's Democratic Rep.	L
• Malaysia	UM
• Maldives	LM
• Mongolia	L
• Nepal	L
• Oman	UM
• Pakistan	L
• Philippines	LM
• Sri Lanka	LM
• Thailand	LM
• Vietnam	L
• Yemen	L

EASTERN EUROPE

AND CENTRAL ASIA (EECA)

• Armenia ³	LM
• Azerbaijan ³	LM
• Belarus ³	LM
• Georgia ³	LM
• Kazakhstan	LM
• Kyrgyz Republic	L
• Russia ^{2**}	UM
• Tajikistan	L
• Turkmenistan	LM
• Ukraine ^{2,3}	LM
• Uzbekistan	L

LATIN AMERICA

• Argentina ²	UM
• Bolivia	LM
• Brazil ^{2**}	LM
• Chile ²	UM
• Colombia	LM
• Costa Rica	UM
• Ecuador	LM
• El Salvador	LM
• Guatemala	LM
• Honduras	LM
• Mexico ²	UM
• Nicaragua	LM
• Panama	UM
• Paraguay	LM
• Peru	LM
• Uruguay	UM
• Venezuela	UM

MEDITERRANEAN PARTNER COUNTRIES (MPC)

• Algeria ³	LM
• Egypt ^{2,3}	LM
• Jordan ^{2,3}	LM
• Lebanon ³	UM
• Libya ³	UM

• Morocco ^{2,3}	LM
• Palestinian-administered areas ³	LM
• Syrian Arab Rep. ³	LM
• Tunisia ^{2,3}	LM

WESTERN BALKAN COUNTRIES (WBC)

• Kosovo ⁴	LM
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*In the 'Specific international cooperation actions', Africa can also be considered as a region on its own, while the Caribbean countries can also participate with Latin American and the Pacific countries with Asia.

**For participation in the 'Specific international cooperation actions' each of Brazil, China, India and Russia may be considered individually as a region on its own. Thus, the required two or more partners can be located in these countries. However, in this case, at least two different partners from different provinces, oblasts, republics or states within Brazil, China, India or Russia are necessary.

In accordance with Article 2(12) of the Rules for Participation in FP7, 'International Cooperation Partner Country' (ICPC) means a third country which the Commission classifies as a low-income (L), lower-middle-income (LM) or upper-middle-income (UM) country. Countries associated to the Seventh EU Framework Programme do not qualify as ICP Countries and therefore do not appear in this list.

¹ Legal entities established in countries in which the European Union under Articles 75 and 215 of the Treaty on the Functioning of the European Union has issued actions to interrupt or to reduce, in part or completely, economic relations, may only participate and receive a financial contribution if it complies with these actions.

² Signed an agreement with the EU covering Science & Technology.

³ These countries are also part of the European Neighbourhood Policy (ENP).

⁴ As defined by UNSC resolution 1244 of 10 June 1999.

* Legal entities established in the high-income territories Hong Kong, Macao and Taiwan, are not eligible under the ICPC provisions.

Annex 2: Eligibility and Evaluation Criteria for Proposals

Eligibility criteria

A proposal will only be considered eligible if it meets all of the following conditions:

- It is received by the Commission before the deadline given in the call text.
- It involves at least the minimum number of participants given in the call text.
- It is complete (i.e. both the requested administrative forms and the proposal description are present)
- The content of the proposal relates to the topic(s) and funding scheme(s), including any special conditions, set out in those parts of the relevant work programme

Other eligibility criteria may be given in the call text.

Evaluation criteria

The evaluation criteria against which proposals will be judged are set out in article 15 of the Rules for Participation. For the 'Cooperation' specific programme these are:

- scientific and/or technological excellence;
- relevance to the objectives of these specific programmes²;
- the potential impact through the development, dissemination and use of project results;
- the quality and efficiency of the implementation and management.

Within this framework, the work programmes will specify the evaluation and selection criteria and may add additional requirements, weightings and thresholds, or set out further details on the application of the criteria.

The purpose of this annex is to set out such specifications. Unless otherwise indicated in the relevant parts of this work programme, the criteria, weightings and thresholds given here will apply to all calls for proposals.

Proposals will be evaluated in line with the Commission 'Rules on Submission of Proposals and the Related Evaluation, Selection and Award Procedures'.

A proposal which contravenes fundamental ethical principles, fails to comply with the relevant security procedures, or which does not fulfil any other of the conditions set out in the specific programme, the work programme or in the call for proposals shall not be selected.

² **Relevance** will be considered in relation to the topic(s) of the work programme open in a given call, and to the objectives of a call. In the scheme set out on the following page, these aspects will be integrated in the application of the criterion "S/T excellence", and the first sub-criterion under "Impact" respectively. When a proposal is **partially relevant** because it only marginally addresses the topic(s) of a call, or because only part of the proposal addresses the topic(s), this condition will be reflected in the scoring of the first criterion. Proposals that are clearly not relevant to a call ("out of scope") will be rejected on eligibility grounds.

Annex 2 of the Cooperation Work Programme

Such a proposal may be excluded from the evaluation, selection and award procedures at any time. Details of the procedure to be followed are given in the Commission rules mentioned above.

The arrangements for a particular call will be set out in the relevant Guide for Applicants.

		1. Scientific and/or technological excellence <i>(relevant to the topics addressed by the call)</i> (award)	2. Quality and efficiency of the implementation and the management (selection)	3. The potential impact through the development, dissemination and use of project results (award)
All funding schemes		<ul style="list-style-type: none"> • <i>Soundness of concept, and quality of objectives</i> 	<ul style="list-style-type: none"> • Appropriateness of the management structure and procedures • Quality and relevant experience of the individual participants 	<ul style="list-style-type: none"> • <i>Contribution, at the European [and/or international] level, to the expected impacts listed in the work programme under relevant topic/activity</i>
Collaborative projects		<ul style="list-style-type: none"> • <i>Progress beyond the state-of-the-art</i> • Quality and effectiveness of the S/T methodology and associated work plan 	<ul style="list-style-type: none"> • Quality of the consortium as a whole (including complementarity, balance) • Appropriateness of the allocation and justification of the resources to be committed (staff, equipment,...) 	<ul style="list-style-type: none"> • Appropriateness of measures for the dissemination and/or exploitation of project results, and management of intellectual property.
Networks of Excellence		<ul style="list-style-type: none"> • <i>Contribution to long-term integration of high quality S/T research</i> • Quality and effectiveness of the joint programme of activities and associated work plan 	<ul style="list-style-type: none"> • Quality of the consortium as a whole (including ability to tackle fragmentation of the research field, and commitment towards a deep and durable integration) • Adequacy of resources for successfully carrying out the joint programme of activities 	<ul style="list-style-type: none"> • Appropriateness of measures for spreading excellence, exploiting results, and disseminating knowledge, through engagement with stakeholders and the public at large.
Co-ordination & Support Actions	CA	<ul style="list-style-type: none"> • Contribution to the co-ordination of high quality research • Quality and effectiveness of the co-ordination mechanisms, and associated work plan 	<ul style="list-style-type: none"> • Quality of the consortium as a whole (including complementarity, balance) [for SA: only if relevant] • Appropriateness of the allocation and justification of the resources to be committed (staff, equipment,...) 	<ul style="list-style-type: none"> • Appropriateness of measures for spreading excellence, exploiting results, and dissemination knowledge, through engagement with stakeholders, and the public at large.
	SA	<ul style="list-style-type: none"> • Quality and effectiveness of the support action mechanisms, and associated work plan 		
Research for the benefit of specific groups		<ul style="list-style-type: none"> • Innovative character in relation to the state-of-the art • Contribution to advancement of knowledge / technological progress • Quality and effectiveness of S/T methodology and associated work plan 	<ul style="list-style-type: none"> • Quality of the consortium as a whole (including complementarity and balance) • Appropriateness of the allocation and justification of the resources to be committed (staff, equipment,...) 	<ul style="list-style-type: none"> • Appropriateness of measures for the dissemination and/or exploitation of project results, and management of intellectual property

Notes:

1. Evaluation scores will be awarded for each of the three criteria, and not for the sub-criteria. Each criterion will be scored out of 5. No weightings will apply. The threshold for individual criteria will be 3. The overall threshold, applying to the sum of the three individual scores, will be 10.
2. The second column corresponds to the **selection criteria** in the meaning of the financial regulation³ (article 115) and its implementing rules⁴ (article 176 and 177). They also will be the basis for assessing the 'operational capacity' of participants. The other two criteria correspond to the **award criteria**.
3. For the evaluation of first-stage proposals under a two-stage submission procedure, only the sub-criteria in italics apply.

Priority order for proposals with the same score

As part of the evaluation by independent experts, a panel review will recommend one or more ranked lists for the proposals under evaluation, following the scoring systems indicated above. A ranked list will be drawn up for every indicative budget shown in the call fiche.

If necessary, the panel will determine a priority order for proposals which have been awarded the same score within a ranked list. Whether or not such a prioritisation is carried out will depend on the available budget or other conditions set out in the call fiche. The following approach will be applied successively for every group of *ex aequo* proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

(i) Proposals that address topics not otherwise covered by more highly-rated proposals, will be considered to have the highest priority.

(ii) These proposals will themselves be prioritised according to the scores they have been awarded for the criterion *scientific and/or technological excellence*. When these scores are equal, priority will be based on scores for the criterion *impact*. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, related to the contribution of the proposal to the European Research Area and/or general objectives mentioned in the work programme (e.g. presence of SMEs, international co-operation, public engagement).

(iii) The method described in (ii) will then be applied to the remaining *ex aequos* in the group.

NOTE: the call fiche may indicate provisions that supplement or override the above.

³ OJ L248 16.9.2002, p1.

⁴ OJ L357 31.12.2002, p1

Annex 3: Forms of Grant and Maximum Reimbursement Rates for Projects Funded Through the Cooperation Work Programme

Forms of Grant

The FP7 'Rules for Participation' propose three potential forms of grant for the Community financial contribution: reimbursement of eligible costs, flat rate financing including scale of unit costs, and lump sum financing. In this work programme, for all funding schemes, the reimbursement of eligible costs (including the different options for flat rates on indirect costs as established in Article 32 of the Rules for Participation)⁵ will be the only form of grant used.

Three exceptions to this will apply. Pursuant to Article 30 of the Rules for Participation and Commission Decision C(2007)2287 of 4 June 2007, participants from International Cooperation Partner Countries (see Annex 1) may choose to opt for lump sum financing.

In accordance with Article 2 of the Commission Decision of 23 March 2009 under reference C (2009) 1942, the present work programme provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. The applicable flat rates are available at the following website http://cordis.europa.eu/fp7/find-doc_en.html under 'Guidance documents/Flat rates for daily allowances'. Please note this option is only available when stated explicitly in the call fiche.

In addition, under chapter 5 of this work programme 'Energy', some actions under Activity 8 'Energy Efficiency and Savings', may combine the reimbursement of eligible costs with flat rate financing in the form of scale of unit costs. Further information on this is given in chapter 5.

Maximum Reimbursement Rates

The upper limits foreseen in the Rules for Participation (Article 33) for the Community financial contribution are summarised in the following table.

	Non-profit public bodies, secondary and higher education establishments, research organisations and SMEs	All other organisations
Research and technological development activities	75%	50% ⁶
Demonstration activities	50%	50%
Coordination and support actions	100%	100%
Management, audit certificates and other activities ⁷	100%	100%

⁵ As confirmed by Decision C(2009)4459 of 15 June 2009.

⁶ For security related research and technological development activities, (Chapter 10 of this work programme) the Community financial contribution may reach a maximum of 75% in the case of the development of capabilities in domains with very limited market size and a risk of 'market failure' and for accelerated equipment development in response to new threats. Further information is given in Chapter 10.

⁷ Including, inter alia training in actions that do not fall under the funding schemes for training and career development of researchers, coordination, networking and dissemination (as set out in Article 33(4) of the Rules for Participation).

Annex 4 General Activities

In this annex, the activities which are funded across the Programme are presented. These activities concern in particular the following:

Dissemination, knowledge transfer and broader engagement

1. The CORDIS services

Co-ordination of non-European Union research programmes

2. The ERA-NET scheme
3. Research organisations in the EU
4. Strengthened coordination with EUREKA
5. Scientific and technological cooperation activities carried out in COST

Risk-Sharing Finance Facility

6. Contribution to the European Investment Bank (EIB) – Risk-Sharing Finance Facility

A4.1 THE CORDIS SERVICES

CORDIS, the Community Research and Development Information Service, supports the European Commission's dissemination of information on EU-funded research projects and their outcomes, as well as their exploitation, since 1990. The web portal is available at: <http://cordis.europa.eu>.

As a continuation of the Work Programme 2012, CORDIS maintains its focus on providing support to the dissemination policy of the Commission and, as expressed in the FP7 Cooperation Specific Programme, CORDIS continues *"to foster the dissemination of knowledge in a user-friendly way and the exploitation of research results"*.

The specific objectives for CORDIS activities in 2013 will be:

- **SO 1: Continued availability and improved usability** for users of CORDIS services including content management, maintenance, operational and supporting activities;
- **SO 2: Consolidation of services** to reflect decisions on the web-based communication strategy;
- **SO 3: Improvement and development of services to disseminate and exploit research results** according to the needs as defined by the research and innovation Directorates-General/Agencies;
- **SO 4: Editorial harmonisation, technical interoperability and ensuring seamless navigation** with the other research-related websites and systems, in particular the Participant Portal and Europa websites.

The budget foreseen for these activities in 2013 is EUR 7.9 million.

The CORDIS services are managed by the Publications Office of the European Union under the governance of the CORDIS Service Management Board (where all research and innovation Directorates-General/Agencies and other stakeholders are represented). Administrative arrangements are set out in the applicable Service Level Agreement between the Research and Innovation Directorate General and the Publications Office. A detailed Work Plan for the CORDIS 2013 activities, including a detailed budget forecast, will be drawn up.

A4.2 PROGRAMME COORDINATION AND COOPERATION IN THE EUROPEAN RESEARCH AREA

A4.2.1 The ERA-NET scheme

The objective of the ERA-NET scheme is to develop and strengthen the coordination of national and regional research programmes through two specific actions:

- 'ERA-NET actions' - which provide a framework for actors implementing public research programmes to coordinate their activities.
- 'ERA-NET Plus actions'- which provide additional EU financial support to facilitate joint calls for proposals between national and/or regional programmes.

Under the ERA-NET scheme, national and regional authorities identify research programmes they wish to coordinate or open up mutually. The participants in these actions are therefore programme 'owners' (typically ministries or regional authorities defining research programmes) or programme 'managers' (such as research councils or other research funding agencies managing research programmes).

Since the introduction of the scheme, a large number of ERA-NETs have been funded, involving hundreds of national research programmes⁸.

ERA-NETs span a wide range of research fields such as transport, energy, environment, industrial technologies, plant and human health, astrophysics and social sciences. ERA-NET actions have been also set up to address more horizontal topics such as international cooperation, SMEs, metrology or the promotion of gender balance in research.

The networking and mutual opening of research programmes require a progressive approach. The ERA-NET scheme therefore has a long-term perspective and it is flexible in order to accommodate the different ways in which public research funding is organised in Member States and Associated Countries.

In contrast to FP6, the ERA-NET scheme is no longer conceived as a 'stand-alone' action in FP7, but as an implementation tool available to the Themes of the Cooperation specific programme and to the Parts of the Capacities Programme.

Several ERA-NETs have been already able to contribute and interact with proposed Joint Programming Initiatives, aimed at addressing major societal challenges. The involvement of programme managers and programme owners in ERA-NETs renders them a useful instrument also in this context.

Thanks to the ERA-NET scheme, tangible progress has been made in reducing fragmentation across the European Research Area (ERA).

For the full list of projects, please refer to:

<http://cordis.europa.eu/coordination/projects.htm>

http://cordis.europa.eu/fp7/coordination/home_en.html

<http://netwatch.jrc.ec.europa.eu/nw>

⁸ ERA-NET actions cover both national and regional research programmes. To avoid repetition, the term 'national research programme' will be used in this section to refer to both national and regional research programmes.

A4.2.2 Content of the FP7-ERANET-2013-RTD Call

In 2013, the ERA-NET scheme plans a cross-thematic call for proposals, open to challenge-oriented strategic priorities explicitly specified in the thematic sections of the Cooperation and Capacities work programmes. The concerned Themes in Cooperation or Parts in Capacities will be responsible for providing the required funding (*please refer to the Call Fiche for details*).

Proposals submitted to the 2013 ERA-NET call shall clearly demonstrate the innovation potential of the planned activities. Participants shall adopt a global approach in their proposals, taking into account that the presence of partners from relevant non-EU countries will be considered a plus during the proposal evaluation phase

ERA-NET topics might be present also in other calls which, for logistical and organisational reasons, are kept distinct from the present one. In order to provide a complete reference on the way in which the scheme will be implemented in 2013, a list of further subjects open for ERA-NETs is provided in appendix to the call fiche.

A4.2.2.1 Activity: ERA-NET actions

Funding Scheme: Coordination and Support Actions (Coordinating Action)

The aim of ERA-NET actions is to network research programmes carried out at national or regional level, with a view to their mutual opening and the development and implementation of joint activities.

"*Research programmes carried out at national or regional level*" refers to entire research programmes, parts of such programmes or similar initiatives. Such programmes shall have all the following characteristics:

- a) Be strategically planned (i.e. be composed of a number of research projects focused on a defined subject area or set of problems, that are scheduled to run for a set period of time and that have a co-ordinated management).
- b) Be carried out at national or regional level.
- c) Be either financed or managed directly by national or regional public bodies, or by structures (e.g. agencies) closely related to, or mandated by, public authorities.

Additional Eligibility Criteria for ERA-NET actions

The minimum number of participants in an ERA-NET action is **3 independent legal entities** which finance or manage publicly funded national or regional programmes. **Each of these shall be established in a different Member State or Associated Country.**

Partners for ERA-NET actions eligible to satisfy the above conditions are:

- Programme owners: typically national ministries/regional authorities responsible for defining, financing or managing research programmes carried out at national or regional level.
- Programme 'managers' (such as research councils or funding agencies) or other national or regional organisations that implement research programmes under the supervision of the programme owners.
- Programme owners (typically national ministries/regional authorities) which do not have a running or fully fledged research programme at the moment of submitting an ERA-NET proposal, but which are planning, and have committed, to set up such a

programme, are also eligible if their participation is well justified and adds value to the overall programme coordination.

Sole participants (as referred to in Article 10 of the Rules for Participation) are eligible if the above-mentioned minimum conditions are satisfied by the legal entities forming together a sole participant. A sole participant shall explicitly indicate which of its 'members' are either programme owners or programme managers in the proposed action, and indicate for these members the respective national/regional programmes which are at the disposal of the proposed ERA-NET action.

Provided that the proposal complies with the minimum number of participants required in an ERA-NET action as described above, the following legal entities are eligible:

- a) Programme owners and programme managers not established in a Member State or Associated Country;
- b) Private legal entities (e.g. charities) which own or manage research programmes, if their participation is well justified and adds value to the overall programme coordination.

Technical content/scope

ERA-NET actions cover the networking of national research programmes on selected topics of science and technology which are identified in the annual work programmes of the Cooperation Themes and the relevant Parts of the Capacities Programme.

The networking of programmes may involve several levels of cooperation and coordination, depending on the degree of maturity of the network. The use of the ERA-NET scheme will make this evolution possible in a gradual fashion.

In this respect, a four-step approach covering the following activities can be envisaged:

- 1) Information exchange
- 2) Definition and preparation of joint activities
- 3) Implementation of joint activities
- 4) Funding of joint trans-national research.

ERA-NET actions should be ambitious and result in concrete progress towards the opening up of, or cooperation between, the participating research programmes. The cooperation should be sustainable beyond the duration of the ERA-NET action itself.

Activities funded

The EU contribution will take the form of a grant consisting of a reimbursement of the eligible costs related to the action.

Activities eligible for funding correspond to the four steps identified in the *technical content/scope* section above. More specifically, these include:

(i) Information exchange

This step aims to gather information on the structure and programmes covered by each national research system. It could also improve communication, develop better reciprocal knowledge and promote trust-building among programme owners or managers in similar

scientific and technological areas through a mutual learning process, and the systematic exchange of information and good practices.

(ii) Definition and preparation of joint activities

This key part of the action will analyse the information gathered in step 1 and identify the type of cooperation and the areas which will be addressed.

It should result in an **Action plan**, which sets out common strategic issues and prepares for a concrete implementation of joint activities.

(iii) Implementation of joint activities

Experience has shown that much of the added value in co-ordinating national programmes is gained by trying to implement joint activities, even if in a pilot form.

ERA-NET actions are therefore encouraged to develop and implement, from an early stage in the project, common, joint, strategic activities such as:

- Clustering of nationally-funded research projects, to develop complementarities or mutual reinforcement of ongoing nationally-funded research programmes.
- Multinational project evaluation procedures (common evaluation criteria and methods of implementation). This could contribute in the long-term to the integration of evaluation practices across national research systems (covering proposal, project and programme evaluation).
- Schemes for joint training activities, such as co-supervised theses and international PhD schemes, to help support a wider cooperation in research.
- Schemes for the mutual opening of facilities or laboratories in one country for scientists from another.
- Converging schemes for programme monitoring and evaluation, including joint monitoring or evaluation.
- Schemes for personnel exchange, in the context of the above activities.
- Specific cooperation agreements or arrangements between participating programmes. These would prepare the ground for further trans-national research programmes and ensure that legal barriers are removed.

(iv) Funding of joint trans-national research

The strongest form of programme networking implies the funding and implementation of a joint programme of trans-national research projects or actions. This is likely to involve the setting-up of a common strategy, a joint work programme, common (mutually open) or joint calls for proposals or tenders, a common trans-national evaluation system and a common plan for dissemination of results or experiences. In such schemes, projects funded out of a common or joint call for proposals should involve *at least two teams from two different countries*.

In this step, other ways of implementing joint research actions could also be developed or explored. For example, a complex or very ambitious research agenda could be divided in various parts, which are each addressed through differentiated national calls. Results would then be shared.

Expected Impact

The ERA-NET scheme aims to reduce the fragmentation of the European Research Area by increasing coordination between participating national research programmes, avoiding unnecessary duplications of effort and developing expertise from mutual learning.

In general, ERA-NET actions should not cover very restricted research domains or overlap with other ongoing ERA-NET actions, as this could create further fragmentation.

ERA-NET actions are expected to deliver concrete results: establishment of solid networks, mutual opening of activities, development and implementation of joint programmes.

The level of ERA-NET actions will depend on their previous experience:

- Proposals from existing ERA-NETs are expected to include a strong coordination action, directly focusing on steps 3 and 4. As such, these proposals should aim to broaden the partnership and/or deepen the coordination between the relevant national programmes in the concerned field. In particular, a global approach including non-European research programmes is encouraged.
- New ERA-NETs, addressing topics not covered by previous ones, are expected to target steps 1 to 3 as a minimum, but are encouraged to aim at the 'four step approach' described above.

The scheme will also enable national or regional systems to collectively take on tasks that they would not have been able to tackle independently.

ERA-NET actions are expected to have a lasting impact. Proposals submitted to the ERA-NET call should provide reliable indications whether the cooperation developed could continue beyond the EU funding. Lessons learned and knowledge gathered should be disseminated throughout the European Research Area.

In addition to the general impact described above, more specific expected benefits of ERA-NET actions include:

- Achieving critical mass, to ensure the better use of scarce resources.
- Joining forces to provide common answers to common research problems.
- Addressing global issues, common to many countries.
- Addressing specific geographical issues.
- Developing common governance principles (e.g. with respect to ethics, good practices).
- Bring together national programmes which deal with cooperation with third countries, and enable them to speak with a 'single voice'.
- Adopt a global approach, involving third-country research programmes in the ERA-NET activities.

Indicative budget for A4.2.2.1: Please refer to *Call Fiche FP7-ERANET-2013-RTD*

A4.2.2.2 Activity: ERA-NET PLUS actions

Funding Scheme: Coordination and Support Actions (Coordinating Action)

Under ERA-NET Plus actions, the Commission provides an incentive to the organisation of joint calls between national or regional research programmes by 'topping-up' joint trans-national funding with EU funding. These joint calls will entail the award of grants to third parties participating in calls for proposals launched under the ERA-NET Plus actions.

These actions require programme owners or programme managers **from at least 5 different Member States or Associated Countries** to plan a single joint call with a clear financial commitment from the participating national or regional research programmes.

Activities funded

The EU will top up the total of the national contributions to the joint call with additional funding for RTD activities. The EU contribution will be limited to a maximum of 33% of the total contributions to the joint call budget. The combined national/regional and EU contributions to the joint calls have to reach **at least EUR 5 million**.

The EU contribution will take the form of a grant for the reimbursement of eligible costs as an agreed proportional contribution to the national pooling of funds.

In accordance with the Decisions concerning the Seventh Framework Programme⁹ and the 'Cooperation' Specific Programme¹⁰, the provisions of Article 120(2) of the Council Regulation on the Financial Regulation applicable to the general budget of the European Communities¹¹ and Article 184a of the Commission Regulation laying down detailed rules for the implementation of Council Regulation on the Financial Regulation applicable to the general budget of the European Communities,¹² shall not be applicable with regard to the financial support provided by the participants in the ERA-NET Plus actions to third parties participating in projects selected following calls for proposals launched under these actions.

The total duration of a given ERA-NET Plus action and of the resulting projects shall **not exceed 5 years**.

⁹ OJ L 412, 30.12.2006, p. 1 Decision No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006

¹⁰ OJ L 400, 30.12.2006, p. 86

¹¹ Council Regulation No. 1605/2002 of 25.6.2002 on the Financial Regulation applicable to the general budget of the European Communities (OJ L248, 16.09.2002, p1).

¹² Commission Regulation No. 2342/2002 of 23.12.2002 laying down detailed rules for the implementation of Council Regulation No. 1605/2002 (OJ L357, 31.12.2002, p1).

Additional Eligibility criteria for ERA-NET Plus actions

- The minimum number of participants in an ERA-NET Plus action is **5 independent legal entities** which finance or manage publicly funded national or regional programmes. **Each of these shall be established in a different Member State or Associated Country.**

Partners for ERA-NET actions eligible to satisfy the above conditions are:

- Programme owners: typically national ministries/regional authorities responsible for defining, financing or managing research programmes carried out at national or regional level.
- Programme 'managers' (such as research councils or funding agencies) or other national or regional organisations that implement research programmes under the supervision of the programme owners.

Sole participants (as referred to in Article 10 of the Rules for Participation) are eligible if the above-mentioned minimum conditions are satisfied by the legal entities forming together a sole participant. A sole participant shall explicitly indicate which of its 'members' are either programme owners or programme managers in the proposed action, and indicate for these members the respective national/regional programmes which are at the disposal of the proposed ERA-NET Plus action.

- Provided that the proposal complies with the minimum number of participants required in an ERA-NET Plus action as described above, the following legal entities are eligible:
 - a) Programme owners and programme managers not established in a Member State or Associated Country;
 - b) Private legal entities (e.g. charities) which own or manage research programmes, if their participation is well justified and adds value to the overall programme coordination.
- A single joint call shall be planned with a clear financial commitment from the participating national or regional programmes¹³.
- The total planned budget of ***the joint call shall have a minimum financial volume of EUR 5 million, EU contribution included.***
- The joint call organised by the national programmes shall establish a set of common general evaluation/selection criteria, such as excellence and European added value.
- A common peer review mechanism for evaluating the proposals submitted to the joint call shall be planned.
- Each project financed out of the joint call shall be trans-national (i.e. minimum of two partners from different Member States or Associated Countries).

¹³ Proposals must demonstrate that national research programmes are committed to support the call. Selected proposals will have to provide evidence that a commitment has been made by the relevant research programmes.

- Detailed rules for participation in the funded trans-national projects shall be defined by the call organisers themselves (i.e participating national or regional programmes).

Expected Impact

ERA-NET Plus actions aim to facilitate the launching of joint calls for proposals between EU Member States or Associated Countries, based on their European added value. In special cases, they may also facilitate the transition of an ERA-NET towards an Article 185 TFEU initiative, where the criteria for the latter are met.

The EU added value will be a critical criterion to evaluate the impact of ERA-NET Plus actions and will depend on the area/topic covered by the research programmes participating in the joint call. Therefore, the following criteria will help to identify the impact of ERA-NET Plus actions offering best prospects for sufficient European added value:

- **Relevance to EU objectives:** The field of the potential topic will be of major interest for the EU as a whole.
- **Framework Programme relevance.** As regards '**objective**': Demonstration that an ERA-NET Plus action in that topic will allow the EU to reach the objective of effectively enhancing the coordination of national research programmes. As regards '**content**': The field of the potential topic is expected to be covered by the Framework Programme both in terms of scientific content and of budget allocation.
- **Pre-existing basis:** The ERA-NET Plus action is expected to build on a pre-existing basis or coordination experience between national programmes in the topic identified.
- **Critical mass:** ERA-NET Plus actions will help national programmes to address research areas that, due to the nature of the field, are better addressed jointly or fields which could not have been addressed independently.
- **Instrument relevance:** Demonstration that ERA-NET Plus is the most appropriate instrument for achieving the Framework Programme goals with regard to coordination of national research programmes (i.e.: avoiding fragmentation, etc.). Demonstration that implementing an ERA-NET Plus action in a given field is more appropriate to coordination goals than other possible FP7 actions.

ERA-NET Plus actions are expected, where appropriate, to facilitate the development of a more global approach to the topics addressed, involving also non European research programme.

ERA-NET Plus actions are expected to have a lasting impact. Proposals submitted to the ERA-NET call shall provide reliable indications whether the cooperation developed could continue beyond the EU funding.

Indicative budget for A4.2.2.2: Please refer to *Call Fiche FP7-ERANET-2013-RTD*

***** Call Fiche FP7-ERANET-2013-RTD *****

Call title: ERA-NET Call 2013

- Call identifier: **FP7-ERANET-2013-RTD**
- Date of publication: 10 July 2012¹⁴.
- Deadline: 28 February 2013, at 17.00.00, Brussels local time¹⁵.

Indicative budgets and Topics¹⁶:

A total of EUR 61.1 million¹⁷ is foreseen for this cross-thematic call, which will be allocated to the ERA-NET and ERA-NET Plus topics detailed in *Table 1* by the individual Themes in the Cooperation Work Programme and Parts in the Capacities Work Programme which are participating in the call.

Table 1 – Overview of the Actions in FP7-ERANET-2013 -RTD
Funding Scheme: Coordination and Support Actions (Coordinating Actions)

Challenge/Activity / Area	Topic identifier	TITLE	Indicative budget (EUR million)
FOOD SECURITY, SUSTAINABLE AGRICULTURE, MARINE AND MARITIME RESEARCH AND THE BIO-ECONOMY			
Socio-economic research and support to policies	KBBE.2013.1.4-01	Sustainable Forest Management and Multifunctional Forestry ERA-NET	2.0
	KBBE.2013.1.4-02	Integrated Pest Management (IPM) ERA-NET	2.0
	KBBE.2013.1.4-03	Mediterranean agriculture ERA-NET	2.0
	KBBE.2013.1.4-04	Information and Communication Technologies and robotics for sustainable agriculture ERA-NET	2.0
	KBBE.2013.1.4-05	Climate smart Agriculture: adaptation of agricultural systems in Europe ERA-NET Plus	4.0

¹⁴ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

¹⁵ The Director-General responsible for the call may delay this deadline by up to two months.

¹⁶ Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

¹⁷ Total indicative budget provided by the concerned Themes for ERA-NET actions. Following the evaluation of proposals, the final total budget of the call, as well the individual sub-budgets independently allocated by each Theme, may vary by up to 10% of the values initially foreseen.

	KBBE.2013.1.4-06	Innovative solutions in organic food and agriculture for next generation of food systems seeking synergies between rural development, natural resource management and food security and quality ERA-NET Plus	3.0
Marine and fresh-water biotechnology	KBBE.2013.3.2-01	Marine biotechnology ERA-NET	2.0
LEADERSHIP IN ENABLING AND INDUSTRIAL TECHNOLOGIES			
Integration	NMP.2013.4.0-7	ERA-NET to support Innovation in the NMP thematic area	1.5
SECURE, CLEAN AND EFFICIENT ENERGY			
Energy: Horizontal Programme Actions	ENERGY.2013.10.1-1	ERA-NET Plus – Bioenergy II: Demonstrations of the European Industrial Bioenergy Initiative	20.0
	ENERGY.2013.10.1-2	ERA-NET Plus – European wind resources assessment	5.0
	ENERGY.2013.10.1-3	Supporting the coordination of national research activities of Member States and Associated States in the field of OCEAN energy (ERA-NET)	2.0
PROTECTING OUR ENVIRONMENT			
Mobilising environment knowledge for policy, industry and society	ENV.2013.6.5-6	ERA-NET Plus – Development of new methodologies, technologies and products for the assessment, protection and management of historical and modern artefacts, buildings and sites	4.0
SMART, GREEN AND INTEGRATED TRANSPORT			
Eco-Innovation	SST.2013.1-3	ERA-NET Plus - Advanced systems, materials and techniques for next generation infrastructure	4.0
INCLUSIVE, INNOVATIVE AND SECURE SOCIETIES			
Socio-economic Sciences and Humanities	SSH.2013.2.1-4	ERA-NET Plus on the future of the welfare state	6.0

Gender and Research	SiS.2013.2.1.1-2 ¹⁸	ERA-NET on the promoting of gender equality in research institutions	1.6
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¹⁸ A dedicated additional eligibility criterion (3 years minimum duration of the action) is applicable to topic SiS.2013.2.1.1-2.

General Eligibility Conditions

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. The completeness criterion also includes that part B of the proposal shall be readable, accessible and printable. Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants

Additional Eligibility Criteria for ERA-NET actions

The minimum number of participants in an ERA-NET action is **3 independent legal entities** which finance or manage publicly funded national or regional programmes. **Each of these shall be established in a different Member State or Associated Country.**

Partners for ERA-NET actions eligible to satisfy the above conditions are:

- Programme owners: typically national ministries/regional authorities responsible for defining, financing or managing research programmes carried out at national or regional level.
- Programme 'managers' (such as research councils or funding agencies) or other national or regional organisations that implement research programmes under the supervision of the programme owners.
- Programme owners (typically national ministries/regional authorities) which do not have a running or fully fledged research programme at the moment of submitting an ERA-NET proposal, but which are planning, and have committed, to set up such a programme, are also eligible if their participation is well justified and adds value to the overall programme coordination.

Sole participants (as referred to in Article 10 of the Rules for Participation) are eligible if the above-mentioned minimum conditions are satisfied by the legal entities forming together a sole participant. A sole participant shall explicitly indicate which of its 'members' are either programme owners or programme managers in the proposed action, and indicate for these members the respective national/regional programmes which are at the disposal of the proposed ERA-NET action.

Provided that the proposal complies with the minimum number of participants required in an ERA-NET action as described above, the following legal entities are eligible:

- a) Programme owners and programme managers not established in a Member State or Associated Country;
- b) Private legal entities (e.g. charities) which own or manage research programmes, if their participation is well justified and adds value to the overall programme coordination.

For topic **SiS.2013.2.1.1-2**, the minimum duration of the action shall be 3 years

Additional Eligibility criteria for ERA-NET Plus actions

- The minimum number of participants in an ERA-NET Plus action is **5 independent legal entities** which finance or manage publicly funded national or regional programmes. **Each of these shall be established in a different Member State or Associated Country.**

Partners for ERA-NET actions eligible to satisfy the above conditions are:

- Programme owners: typically national ministries/regional authorities responsible for defining, financing or managing research programmes carried out at national or regional level.
- Programme 'managers' (such as research councils or funding agencies) or other national or regional organisations that implement research programmes under the supervision of the programme owners.

Sole participants (as referred to in Article 10 of the Rules for Participation) are eligible if the above-mentioned minimum conditions are satisfied by the legal entities forming together a sole participant. A sole participant shall explicitly indicate which of its 'members' are either programme owners or programme managers in the proposed action, and indicate for these members the respective national/regional programmes which are at the disposal of the proposed ERA-NET Plus action.

- Provided that the proposal complies with the minimum number of participants required in an ERA-NET Plus action as described above, the following legal entities are eligible:
 - a) Programme owners and programme managers not established in a Member State or Associated Country;
 - b) Private legal entities (e.g. charities) which own or manage research programmes, if their participation is well justified and adds value to the overall programme coordination.
- A single joint call shall be planned with a clear financial commitment from the participating national or regional programmes¹⁹.
- The total planned budget of ***the joint call shall have a minimum financial volume of EUR 5 million, EU contribution included.***
- The joint call organised by the national programmes shall establish a set of common general evaluation/selection criteria, such as excellence and European added value.
- A common peer review mechanism for evaluating the proposals submitted to the joint call shall be planned.

¹⁹ Proposals must demonstrate that national research programmes are committed to support the call. Selected proposals will have to provide evidence that a commitment has been made by the relevant research programmes.

- Each project financed out of the joint call shall be trans-national (i.e. minimum of two partners from different Member States or Associated Countries).
- Detailed rules for participation in the funded trans-national projects shall be defined by the call organisers themselves (i.e. participating national or regional programmes).

Evaluation Criteria for ERA-NET and ERA-NET Plus proposals

For the evaluation of ERA-NET and ERA-NET Plus proposals, the general criteria and thresholds applicable to Coordination and Support Actions given in Annex 2, are complemented as follows:

1. Scientific and/or technological excellence - Quality of coordination (Threshold 3/5)

Level of ambition in the collaboration and commitment of the participants in the proposed ERA-NET / ERA-NET Plus action to coordinate their national/regional research programmes.

2. Quality and efficiency of the implementation (Threshold 3/5) – no additional criteria

3. Potential impact (Threshold 3/5)

Contribution to establishing and strengthening a durable cooperation between the partners and their national/regional research programmes.

A reserve list may be produced of proposals that pass the evaluation, but fall below the available budget.

- Proposal format:
 - Applicants shall ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the Electronic Submission Services of the Commission. The Commission will instruct the experts to disregard any pages exceeding these limits. The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) shall be at least 15 mm (not including any footers or headers).
- Evaluation procedure:
 - The evaluation will follow a single stage procedure.
 - Proposals will not be evaluated anonymously.
 - Proposals may be evaluated remotely.
- Indicative timetable:
 - Evaluation in April 2013.
 - Opening of negotiations in June 2013.
 - Selections from October 2013.
 - Grant agreements from December 2013.
- Consortia agreements:
 - Consortia Agreements are recommended.

The forms of grant and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme. This call provides the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within

grants for indirect actions. For further information, please refer to the relevant Guide for Applicants. The applicable flat rates are available on the Participant Portal at: http://ec.europa.eu/research/participants/portal/page/fp7_documents under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

***** End of Call Fiche FP7-ERANET-2013-RTD *****

***** Appendix to Call Fiche FP7-ERANET-2013-RTD *****

For information purposes: overview of **ERA-NET topics**, open for other Themes in Cooperation and Parts in Capacities, ***which are not included*** in the **cross-thematic ERA-NET Call 2013** described in the previous section.

Challenge/Activity /Area	Topic identifier	TITLE	Indicative budget (EUR million)
INNOVATION IN INFORMATION TECNOLOGIES			
Alternative Paths to Components and Systems	ICT-2013.3.2 ²⁰	Photonics ERA-NET Plus	4.0
Future and Emerging Technologies (FET)	ICT-2013.9.9 ²¹	FET Flagships ERA-NET	2.0
INTERNATIONAL COOPERATION			
Supporting the coordination of national and regional policies and activities of Member States and Associated countries in the field of international cooperation	FP7-INCO-2013-3.1 ²²	ERA-NET / ERA-NET Plus supporting cooperation with: - India - Latin America and Caribbean countries - Mediterranean Partner countries - Russia	10.0

***** End of Appendix to Call Fiche FP7-ERANET-2013-RTD *****

²⁰ In call FP7-ICT-2013-11 with planned publication date of 18/9/2012

²¹ In call FP7-ICT-2013-11 with planned publication date of 18/9/2012

²² In call FP7-INCO-2013-3 with planned publication date of 10/7/2012

A4.2.3 External expertise

Funding Scheme: Coordination and Support Actions (Independent Experts²³)

It is planned to appoint independent experts to carry out the following tasks:

- The evaluation of the proposals submitted to the cross-thematic calls *FP7-ERANET-2013-RTD*.
- Where appropriate, the review of running projects.

Indicative budget for A4.2.3: EUR 100 000

A4.3 SUPPORT FOR COORDINATION AND COOPERATION WITH AND BETWEEN INTERGOVERNMENTAL AND OTHER HIGH-LEVEL SCIENTIFIC AND RESEARCH ORGANISATIONS IN THE EU, IN THE CONTEXT OF THE ERA.

The cooperation with European Research Organisations and their umbrella associations is object of continuous attention.

It is envisaged to pursue the effort of improving co-ordination with EIROforum and its members by creating new partnerships aimed at valorising the contributions these institutions could make towards reaching EU 2020 objectives.

On the same line, the dialogue with National Research Councils and other (non-University) Research Organisations shall be also sustained, with particular attention paid to the important role that Research Councils could play, when acting as National Funding Agencies, in improving the efficiency of trans-national research collaborations.

Indicative budget for A4.3: No operational appropriations

A4.4 STRENGTHENED COORDINATION WITH EUREKA (PRO MEMORIA)

Funding Scheme: Other Actions (Subscription²⁴)

The Specific Cooperation Programme will support coordination activities aimed at increasing complementarities and synergy between EUREKA and the Framework Programme in areas of common interest. The EU is a member of EUREKA and, as such, contributes to the budget of the EUREKA Secretariat: membership fees are expected to total about EUR 2 million for the duration of the Seventh Framework Programme.

Indicative budget for A4.4: EUR 400 000

²³ In accordance with Articles 14(c), 17 and 27 of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the 7th Framework Programme and for the dissemination of research results (2007-2013).

²⁴ In accordance with Article 14(d) of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the 7th Framework Programme and for the dissemination of research results (2007-2013), and in accordance with Article 108(2)(d) of the Financial Regulation and Article 160a of the detailed rules of the implementation of the Financial Regulation.

A4.5 SCIENTIFIC AND TECHNOLOGICAL COOPERATION ACTIVITIES CARRIED OUT IN COST

*Funding Scheme: Coordination and Support Actions – Named Beneficiary*²⁵

COST is a long-standing, intergovernmental framework that facilitates coordination and exchanges between nationally funded scientists and research teams operating in a variety of fields. During the 6th and 7th Framework Programmes, COST underwent significant reforms.

The Innovation Union Flagship sets out a *strategic approach to innovation and is key to achieving the goals of the Europe 2020 Strategy for a smart, sustainable and inclusive economy.*

COST, as an integral part of the Innovation Union and the European Research Area, is expected to contribute to the delivery of the Europe 2020 agenda and the Innovation Union goals through efficient implementation of the COST networking activities.

Specifically, the Innovation Union calls for an inclusive research and innovation policy and, to this effect, COST shall contribute by bringing together "pockets of excellence", which are not yet well integrated in European and global research and visible in European cooperation, thereby also enhancing capacity building.

Under FP7, support to COST is provided through a grant agreement between the Commission and the legal entity designated by COST as its implementing agent, whose identity was communicated to the Commission by the General Secretariat of the Council and identified in the annual Cooperation work programme. The legal entity designated by COST as its implementing agent is the European Science Foundation²⁶.

The first four instalments of the FP7 COST grant, of EUR 30 million each, covered consecutive 12 month periods spanning until 1 June 2011. Following the FP7 COST mid-term evaluation, further 12-month extensions were granted in 2011 and 2012 with an annual contribution of EUR 43.3 million. A new extension of the grant agreement for a further 12 months is foreseen also in 2013, until 1 June 2014, with a corresponding financial contribution of EUR 43.4 million.

Indicative budget for A4.5: EUR 43 400 000

²⁵ In accordance with Article 14(a) of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

²⁶ The European Science Foundation is established in 1 Quai Lezay Marnesia, 67080 Strasbourg CEDEX, France.

A4.6 RISK-SHARING FINANCE FACILITY

In accordance with Annex III to the Cooperation Specific Programme, the European Union (EU) provides a contribution to the European Investment Bank (EIB), which is a risk-sharing partner for the debt financial instrument, entitled "Risk-Sharing Finance Facility" (RSFF). RSFF is co-funded by the European Union and the EIB. It aims at fostering primarily private sector investment across Europe in research, technological development, demonstration and innovation²⁷ (RDI). This financing instrument was designed by the Commission and the EIB, and launched in June 2007.

A4.6.1 Context

Political landscape

Against the backdrop of the current economic situation and increased global competition, the EU has defined a strategy to support growth and job creation "Europe 2020". The Innovation Union initiative supports this strategy through specific commitments. Research and innovation are key drivers of competitiveness, jobs, sustainable growth and social progress.

The work programme 2013 aligns with, and contributes towards, the objectives of Europe 2020, the Innovation Union Flagship Initiative and other policies, in particular to bring together research and innovation to address major challenges and to enhance access to finance for enterprises.

Access to finance to support investments in RDI is part of the Innovation Union Flagship Initiative. Its Commitment No. 10 is that by 2014, the EU should put in place financial instruments to attract a major increase in private finance and close market gaps in investing in research and innovation (RDI). The Commission proposal on Horizon 2020 also put emphasis on raising private investment and access to risk finance (through loan guarantees and equity instruments).

There is a determined focus on fostering new ideas, supporting world class teams tackling significant societal challenges and on ensuring that the fruits of EU investments can be properly exploited.

In this way the work programme provides for a smooth transition towards the new research and innovation programme for 2014-2020, Horizon 2020.

An Independent Expert Group in charge of RSFF interim evaluation underlined its successful achievements and proposed improvements in 2010²⁸. On this basis, the European Council, in its conclusions of 4 February 2011 on Innovation²⁹, invited the Commission to present proposals by the end of 2011 for scaling-up the RSFF and for assessing how best to meet the needs of fast-growing innovative companies through a market-based approach. The European Parliament expressed similar requests.

Responding to the European Council's and European Parliament's requests, the EU and the EIB signed Amendment No. 4 to the RSFF cooperation agreement on 5 December 2011. The

²⁷ See below under 'Innovation dimension of the activity'.

²⁸ See Report of the Independent Expert Group in charge of the RSFF evaluation:

http://ec.europa.eu/research/evaluations/index_en.cfm?pg=rsff

and the response: European Commission Communication COM(2011) 52 'On the Response to the Report of the Expert Group on the Interim Evaluation of the Seventh Framework Programme for Research, Technological Development and Demonstration Activities and to the Report of the Expert Group on the Interim Evaluation of the Risk-Sharing Finance Facility':

http://ec.europa.eu/research/evaluations/pdf/archive/other_reports_studies_and_documents/commission_response_fp7_ie_report_2011.pdf#view=fit&pagemode=none

²⁹ Doc EUCO 2/11.

project-by-project risk-sharing approach is replaced by a portfolio approach. The EU can assume a higher risk for a higher multiplying effect of its contribution: the EU financial contribution is used as a first-loss piece³⁰. The RSI (Risk-Sharing Instrument for SMEs and mid-sized companies) has also been created.

Approach for 2013

RSFF Context

The RSFF has repeatedly been showcased as an example of how EU resources can leverage private funding for a larger impact in achieving EU objectives. It has also been hailed as a model for collaboration between the EU and the EIB³¹.

Private investment in research and innovation in Europe remains below the level necessary to achieve the ambitions of the Europe 2020 strategy. In addition to grants, other mechanisms – in the form of financial instruments including the RSFF – have proven effective in leveraging private investment by firms, thus mobilising the financial markets and diversifying funding sources for European RDI actions.

The financial crisis has made access to finance for innovative companies even more difficult as banks have become more than ever risk-averse. As a result, risk capital for private investments in RDI is very scarce. In addition, public financial support for RDI at national level is also scarce, fragmented and cyclical depending on the availability of budget resources in the EU Member States.

Improving access to loans for RDI actions requires public support to overcome market deficiencies for the financing of European RDI actions, which often involve a high level of risk. This message has been reinforced by the Statement of the Members of the European Council of 30 January 2012³² that underlined the need of urgent measures to boosting the financing of the economy, in particular SMEs. It called for "*strengthening EIB support for SMEs and infrastructure*", and invited "*the Council, the Commission and the EIB (...) to consider possible options to enhance EIB action to support growth and to make appropriate recommendations*".

One of the key challenges of the 2013 RSFF work programme is to support the implementation of the Innovation Union and to improve access to the appropriate forms of finance to increase RDI investment, especially private, in Europe.

The RSFF contributes to addressing the financing needs of innovative projects and companies, with a particular emphasis on SMEs. Needs may vary considerably depending on sectors, types of innovation and stages of business development. The RSFF contributes to improving access to finance across the entire spectrum, from research, development to innovation. The RSFF also addresses cross-sector policy goals – as defined in the Cooperation Specific Programme³³ – and related investments needs.

³⁰ The EU contribution would be used first to cover potential losses for a portfolio of loans provided to a specific target group, up to a defined percentage of losses ("first-loss" cushion). Only if potential losses were to exceed the EU contribution, the EIB contribution to the RSFF would be used to cover such further losses on an agreed basis.

³¹ In the words of President Barroso, the RSFF is "an excellent example to build on in order to improve the blending between grants from the EU budget and EIB loans" (in the *Political Guidelines for the Next Commission*, 2009).

³² http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/127599.pdf

³³ With the exception of Socio-Economic Sciences and the Humanities Themes.

The RSFF focus for 2013 is on maximising the implementation level for target groups that have so far been relatively less attracted to the RSFF, in particular innovative SMEs under the Cooperation Specific Programme.

In 2013, the Commission and the EIB Group will implement the major changes introduced in the RSFF Cooperation Agreement, following the RSFF interim evaluation, on the first hand; and will more than double their efforts to support SMEs and smaller mid-caps, on the other hand.

In addition, with the same spirit of the RSFF interim evaluation of 2010, a group of very-high level independent experts will evaluate the RSFF activities in mid-2013. The evaluation will notably assess to which extent the Commission and the EIB Group have implemented the recommendations of the RSFF interim evaluation for a better support to innovative SMEs. This will feed into the process of designing an enlarged and expanded debt financing facility in Horizon 2020 to increase the leverage and multiplier effects of such an instrument in total RDI investments.

Innovation dimension of the activities and bridging towards Horizon 2020

The Innovation Union and Horizon 2020 give increased weight to innovation. It is worth noting that the RSFF has financed support to innovation already since 2007.

This RSFF work programme contains innovation measures in support of activities closer to the market such as support to market-uptake, notably through more activities aimed at generating knowledge to deliver new and more innovative products, processes and services. This notably supports activities such as prototyping, testing, demonstrating knowledge transfer, proof of concept and activities addressing exploitation of existing research results. The demand-driven nature of the RSFF also encourages innovation and particularly the industrial participation, on a market basis.

The EU–EIB risk-sharing arrangement ensures that RSFF can cover activities from any part of the value-chain (e.g. from "blue-sky" research to commercialisation activities, encompassing innovation). The RSFF interim evaluation showed that the majority of approved loans financed technological development and innovation activities in the period 2007-2009.

Regarding the EU financial contribution, costs related to innovation activities are eligible for EU RSFF Operations if they comply with the provisions of the RSFF Cooperation Agreement³⁴. In 2013 and for the second year, the RSI also supports innovation driven SMEs and small midcaps that comply with defined eligibility criteria.

Increasing the EU financial contribution to the RSI will not only ensure that the RSFF can continue lending activities during its last year of operation for SMEs and smaller mid-caps, but will also prepare for a smooth transition to the scaled-up debt facility foreseen as part of the "Access to Risk Finance" component of Horizon 2020.

An increased support to innovative SMEs: more than doubling the efforts and the expected impact of the RSI (Risk-Sharing Instrument for SMEs and small midcaps)

In 2013, the EIB Group and the Commission will not only continue to roll out the RSI as a major priority for its second implementation year, but will also more than double its budget, with the double objective to better satisfy market demand and to also address the market segment represented by promotional banks with riskier loan portfolios, thus effectively

³⁴ As stated below in Article A4.6.2: 'Selection of Projects for Financing and the Eligibility Criteria'.

covering a wider spectrum of lending initiatives in support of innovative SMEs and smaller midcaps.

The RSI encourages banks to provide loans to innovative SMEs and small mid-sized firms investing in RDI. The European Investment Fund (EIF) manages this facility as an intermediary of the EIB.

This specific RSFF facility incentivises intermediaries to build sub-portfolios of loans for RDI investments by SMEs and small midcaps. The emphasis is to support and enlist financial intermediaries that can finance RDI-intensive SMEs.

In 2013, the RSI activities are proposed to be financed by an additional EU financial contribution (of EUR 150 million) through the allocation of a share of third countries appropriations devoted to the Cooperation Specific Programme³⁵. This additional budget will complement the EUR 120 million that the EU paid from the Cooperation Specific Programme to the EIB Group to finance this pilot scheme in 2012.

Appropriate coordination is ensured with complementary EU instruments, such as the SME Guarantee Facility (SMEG) and the High Growth and Innovative SME Facility (GIF), debt and equity financial instruments funded under the *Competitiveness and Innovation Framework Programme 2007-13 (CIP)*.

The EIB can only be directly involved in operations with financing requirements in excess of EUR 7.5 million. Smaller requests will be directed to financing partners established in Member States or Associated Countries with whom the EIB Group has or will develop risk-sharing arrangements, including Framework Facilities designed to provide intermediated financing to small projects, notably those promoted by SMEs.

Dissemination actions

Information on the RSFF is available online³⁶. The Commission will respond to further needs of potential beneficiaries for information on the RSFF (by, e.g., awareness-raising activities in conjunction with the EIB, participation to thematic events).

Since 2006, the EIB Group and the Commission services have carried out an intensive awareness-raising campaign to reach stakeholders in as many Member States and Associated Countries as possible. Such awareness-raising actions will continue in 2013, with special focus on the most RDI-intensive sectors in Europe, target groups (including SMEs and potential RSI intermediaries) and countries which have not yet benefited from the RSFF enough. However it should be noted that loans can only be signed under RSFF until 31 December 2013.

The RSFF involves the development of financial engineering solutions adapted to the needs of European RDI actions. Such solutions are implemented and tested by the EIB Group and its financing partners. As soon as such a solution can be considered replicable, case studies of risk-sharing arrangements with financing partners and new products developed specifically for RSFF are published on the EIB's dedicated RSFF web-site.

A number of workshops for representatives of Member States and Associated Countries have been held since the launch. They have disseminated financial engineering solutions and sought future cooperation opportunities. Initiatives of this kind continue in 2013, both at European and national level, to make the link with Horizon 2020.

³⁵ subject to the availability of credits.

³⁶ See: <http://www.eib.org/products/loans/special/rsff/index.htm?lang=en> and on the RSI: http://www.eif.org/what_we_do/guarantees/RSI/index.htm

Contacts with potential clients

The RSFF dedicated websites and other awareness raising activities have resulted in applications from promoters of European RDI activities. In parallel, the EIB Group has numerous contacts with research-intensive companies to explain the new financing options made possible by the RSFF and the RSI.

All types of legal entities, irrespective of size (including SMEs in particular and research organisations, including universities) may benefit from this facility to support their eligible operations.

The objective is also to increase the participation in RSFF in as many Member States and Associated Countries as possible. The EIB Group shall use all reasonable efforts to ensure that the RSFF is also offered by means of financial intermediaries active in as many Member States and Associated Countries as possible, to support eligible innovative SMEs and midcaps. This shall comply with the EIB Group's usual rules and procedures and the specific RSI eligibility criteria. For the RSI, the EIF assesses the applications from financial intermediaries on a first-come, first-served basis, according to the provisions of the RSI open call for expression of interest³⁷.

If there are difficulties in identifying financial intermediaries interested in joining the EIB Group's network for RSFF purposes, the Member States and Associated Countries are aware of the dependence on their best efforts to ensure themselves that this does not damage the interests of potential participants in their countries.

A yet broader geographical distribution of projects is expected. Appropriate performance indicators are in place to encourage the EIB Group to do so. The participation rate has risen steadily to over 20 participating countries. Moreover, European added-value is not only ensured by the geographical distribution of projects. It also stems from the actual design of projects: a client may have RDI operations in several countries even if the concrete RSFF loan is extended to a sole client.

International Co-operation

In accordance with the provisions of the Cooperation Specific Programme, the EIB may only use the EU contribution to RSFF to cover risk of operations limited to those borrowers or beneficiaries of guarantees from legal entities from Third Countries other than Associated Countries who participate in FP7 projects and whose costs are eligible for EU funding.

Cross-thematic approach

By nature and through the EU-EIB partnership, the RSFF mechanism responds to a cross-thematic approach: it finances RDI activities in a wide spectrum of sectors. Moreover, the EU contribution – coming from the FP7 Cooperation Specific Programme – can be used to support RSFF operations eligible under different contributing Themes³⁸.

RSFF operations are provided on a market-driven and first-come, first-served basis. However, the RSFF addresses a cross-cutting variety of research areas to tackle societal challenges responding directly to EU objectives. Theme-wise, the RSFF has already supported concrete projects, and will continue to do so, for example in the following areas: “health, demographic change and wellbeing”, “secure, clean and efficient energy”, “smart, green and integrated transport” and “climate action and resource efficiency”.

³⁷ http://www.eif.org/what_we_do/guarantees/RSI/index.htm

³⁸ See below under A4.6.2 'Selection of Projects for Financing and the Eligibility Criteria'. Contributing Themes do not include Socio-Economic Sciences and Humanities.

The RSFF is a useful complement to reach key objectives of Horizon 2020, in particular to raise private investment and foster industrial leadership, competitive frameworks and business-led R&D.

It supports projects in enabling industrial technologies (ICT, nanotechnology, materials, biotechnology, manufacturing, space) and provides support for innovative SMEs.

The financial instruments will prioritise supporting RDI that furthers the cross-cutting policy objectives of Europe 2020, such as improving the environment, combating climate change, improving resource and energy efficiency, fostering eco-innovation, ensuring global food security and maintaining the health and well-being of an ageing population.

Addressing the financing needs of the Technology Platforms and Joint Technology Initiatives

The EU and the EIB follow the developments of Technology Platforms and their strategic research agendas to identify possible financing needs which the EIB could address. In some cases customised products, individual or wholesale, may be developed, if relevant and in co-operation with other financial institutions if necessary.

The Commission and the EIB follow the development of Joint Technology Initiatives and the initiatives undertaken by their stakeholders. They may advise the stakeholders on available options to optimise their financing packages, if relevant. This may involve bridge financing as well as individual customised financing solutions, specifically adapted to the financing needs.

Modalities of RSFF implementation

Within the framework of a maximum contribution of EUR 1 billion for the period 2007-2013, the EU has provided its first contributions to the EIB for RSFF for an amount of EUR 949.6 million for the period 2007-2012³⁹, EUR 798 million of which coming from the Cooperation Specific Programme. For 2013, it is expected that the EU transfers EUR 200 million to the EIB Group, of which EUR 50 million to Capacities Specific Programme⁴⁰ and 150 million to Cooperation Specific Programme⁴¹. The EIB Group is the sole beneficiary of this EU action. Pursuant to an EIB decision of 9 June 2006, the EU contribution will be matched by an equivalent amount from the EIB (up to EUR 1 billion for the period 2007-2013).

The EU and the EIB signed the Cooperation Agreement with respect to the Risk-Sharing Finance Facility (RSFF) – the RSFF Cooperation Agreement – on 5 June 2007. The Commission amended it on the basis of the Commission Decision C(2008)8058 – 12/12/2008 authorising the Director-General of the Directorate-General for Research to conclude further amendments to the Agreement on behalf of the Commission on a number of points specified in the decision).

³⁹ For the record, an amount of EUR 70 million was front-loaded from 2010 budget to the 2009 budget in response to the financial and economic crisis for the Cooperation Specific Programme. An additional contribution of EUR 1.5 million in 2009 was requested by the budgetary authority for the Capacities Specific Programme, consequently increasing the total EU contribution for 2007-2010 to EUR 501.5 million. (All amounts mentioned here are voted credits). In 2012 and 2013, like other parts of FP7, RSFF is contributing to the "FP7 redeployment for ITER".

⁴⁰ This amount corresponds to voted credit appropriations only and also assuming that the draft Budget for 2013 is adopted without modifications by the Budgetary Authority. It may be complemented by an additional amount corresponding to the allocation to RSFF of the EFTA credits and by other Third Countries appropriations.

⁴¹ From a share of the third countries dedicated to Cooperation Specific Programme subject to the availability of credits.

The Cooperation Agreement defines terms and conditions related to RSFF and, in particular, to the use of the EU contribution in RSFF, the risk-sharing methodology, the indicative annual budget, the reporting conditions, the governance, the rules for establishment of network of financial intermediaries in all Member States and Associated Countries and their related conditions.

It was subject to the following amendments: The first amendment on 26 February 2009 simplifies and harmonizes the financial reporting requirements and rules for asset management with other Commission funds managed by the EIB. It allows, *inter alia*, for the allocation to RSFF of the Third Country Appropriations. The second amendment on 8 September 2009 specifies the EU contribution for 2009 and simplifies reporting dates. The third amendment on 5 January 2011 specifies the EU contribution for 2010.

The recommendations of the Independent Expert Group in charge of the RSFF interim evaluation were endorsed by the Commission in its Communication of 9 February 2011⁴². Amendment No. 4 was signed accordingly on 5 December 2011.

Governance

RSFF implementation is managed by the EIB in accordance with its own rules and procedures and in compliance with the RSFF Cooperation Agreement (and its subsequent amendments). The RSFF implementation, in particular the use of the EU Contribution, is supervised by a Steering Committee. It is composed by at least four representatives, at Director level, from the Commission and the EIB.

The Commission continues to monitor closely the effective use of the EU Contribution. This includes ex-post assessments of the features of the action. It reports regularly to the Programme Committee. In addition, the Commission includes the main findings in the annual report on research and technological development activities which it sends to the European Parliament and the Council pursuant to Article 190 TFEU. The RSFF interim evaluation concluded very positively on the implementation phase of the RSFF. A group of very-high level independent experts will again evaluate the RSFF activities in mid-2013. The group will in particular assess to which extent the Commission and the EIB Group have implemented the recommendations of the RSFF interim evaluation, notably for a better support to innovative SMEs.

A4.6.2 Selection of Projects for Financing and the Eligibility Criteria

The EIB was recognised as a beneficiary of the EU action in the Council and Parliament decision adopting the Seventh Framework Programme.

In accordance with the principles established in the Cooperation Specific Programme, the EIB uses the EU contribution on a "first come, first served basis" to cover part of the risks associated with its operations supporting eligible European RDI actions.

The EU contribution to RSFF supports activities which can be classified as "fundamental research", "industrial research" or "experimental development", as defined in the Framework for State Aid for Research and Development and Innovation⁴³. Prototypes and pilot projects, which are part of "experimental development", are eligible if they fulfill the conditions specified therein. Innovation activities intended to prepare the commercial use of research results within the time period of the project (such as training, technology management and

⁴² COM(2011) 52.

⁴³ OJ C323, 30.12.2006

transfer) are eligible if they are linked to and complementary to research, technological development activities and/or demonstration activities.

The EU contribution will also support innovative SMEs and mid-sized companies under RSI, in compliance with the eligibility criteria mentioned in the RSFF Cooperation Agreement. Other innovation activities of a commercial nature are eligible for RSFF only via the use of the EIB's own contribution.

The RSFF Cooperation Agreement comprises also a list of exclusions criteria for the support of the EU contribution, in compliance with the Seventh Framework Programme and its Cooperation Specific Programme.

A4.6.3 The Commission Right to Object to the Use of the European Union Contribution

The Commission has a right to express its opinion on each and every financial operation proposed by the EIB to its Board for decision under Article 21 of the EIB Statutes. Where the Commission delivers an unfavourable opinion, the EIB Board may not grant the loan or guarantee concerned, unless it votes unanimously in its favour, the Commission nominee abstaining. Should the EIB proceed with financing despite the Commission's negative opinion the EU contribution to RSFF may not be used.

In accordance with the EU FP7 Rules of Participation and the RSFF Cooperation Agreement, the Commission may object, in duly justified cases, for the use of the EU contribution to cover the risk for a loan or a guarantee proposed by the EIB. If such a case arises the Commission may conduct an independent, internal or external, review of such a case.

A4.6.4 European Union Financial Contribution to RSFF in 2013

All Themes of this work programme contribute on a proportional basis, except the Socio-Economic Sciences and the Humanities Theme, which does not contribute to RSFF.

After the interim evaluation of the RSFF, the Commission endorsed the recommendation of the Independent Expert Group to release up to EUR 500 million for the period 2011-2013. By voting the EU budgets 2011 and 2012 (including a total of around EUR 450 million for the RSFF), the Council and the European Parliament agreed in principle on the release of the second tranche. In the conclusions of the Competitiveness Council of 9 March 2011, the Council agreed with the recommendation of the Independent Expert Group to release an additional EU contribution of up to EUR 500 million for the period 2011-2013. It also asked the Commission for proposals to scale up the RSFF⁴⁴.

The Commission proceeds annually with an equal amount of commitment and payment of the EU contributions to RSFF.

It is based on the EIB's activity and forecast report and its request for the amount of the contribution estimated necessary for the following year.

⁴⁴ See final Council conclusions on the interim evaluation of the RSFF on 04/03/2011: "*Regarding the role of the Risk-Sharing Finance Facility (RSFF) in FP7, the Council WELCOMES the finding of the Independent Expert Group (IEG) that RSFF has been a success, both in quantitative and qualitative terms and that very considerable results on an EU-wide scale have been achieved since its launch. The Council therefore AGREES with the recommendation of the IEG, also supported by the Commission, to release an additional EU contribution of up to EUR 500 million for the period 2011-2013 under the conditions foreseen in the FP7 Decision in accordance with the applicable procedures. The Council CALLS ON the Commission, in liaison with the European Investment Bank, to urgently examine ways and means to improve the take-up by currently underrepresented target groups, in particular SMEs, universities and research infrastructures with a view to achieving significant progress in 2012. A specific SME lending mechanism within the current facility is being designed by the Commission, the European Investment Fund and the EIB in this respect. The Council is looking forward to the Commission proposals called for by the European Council for scaling up the RSFF.*"

In 2013, the Commission commits an amount of EUR 50 million to Capacities Specific Programme⁴⁵, and an additional amount of EUR 150 million to Cooperation Specific Programme to more than double the efforts to improve access to debt finance for SMEs and mid-caps.

Between 2007 and 2012, the EU has already exhausted the entire budget of primary credits initially foreseen under the Cooperation Specific Programme to RSFF (EUR 798 million^{46&47}) to match the level of the demand. In 2012, more than half of the EU financial contribution dedicated to RSFF was allocated to support SMEs and smaller midcaps (i.e. EUR 120 million for the RSI). In 2013, it is proposed to more than double this effort (i.e. EUR 150 million) through the allocation of a share of third countries appropriations devoted to the Cooperation Specific Programme⁴⁸. Increasing the EU financial contribution will not only ensure that the RSFF can continue lending activities during its last year of operation, in particular for SMEs and smaller mid-caps, but will also prepare for a smooth transition to the scaled-up debt facility foreseen as part of the "Access to Risk Finance" component of Horizon 2020.

In addition, on the basis of existing resources, the EIB remains able to sign new RSFF loans and guarantees until the end of 2013 for investments in RDI carried out by mid-sized and larger companies as well as larger-scale stand-alone projects in all FP7 contributing thematic priorities

A4.6.5 Process for Recovering and Reallocating unused European Union Funds

In order to mitigate the risk of accumulation of unused funds the multi-annual planning will be adjusted on the basis of reports. They include a pipeline report (summary of information on projects considered for financing) and demand forecasts. Amounts committed but not used for RSFF operations will be reallocated to other activities of the contributing Themes.

Notwithstanding the above and unless the Council and the European Parliament adopting Horizon 2020 for the period post 2014 decide otherwise, the Commission will recover from the EIB any unused funds of the EU contribution (including interest and income) which have not been used or committed to be used or are required to cover eligible costs on 31 December 2013, as defined in the RSFF Cooperation Agreement.

⁴⁵ This amount corresponds to primary-credit appropriations only.

⁴⁶ In primary credits.

⁴⁷ RSFF is participating to the "FP7 redeployment for ITER" (around EUR 2 million in 2012 from Cooperation RSFF and around EUR 2 million in 2013 from Capacities RSFF).

⁴⁸ subject to the availability of credits

FINANCIAL OVERVIEW FOR GENERAL ACTIVITIES FOR 2013

The following provides a financial overview for 2013 of the activities which are funded across the Cooperation Programme:

Activity	Funding for 2013 *
A4.1 CORDIS	EUR 7.90 million
A4.2 ERA-NET scheme (cross-thematic)	EUR 0.10 million <i>broken down as follows:</i>
A4.2.2.1 ERA-NET Actions **	EUR 0.00 million
A4.2.2.2 ERA-NET Plus Actions **	EUR 0.00 million
A4.2.3 External expertise	EUR 0.10 million
A4.3 Research Organizations	EUR 0.00 million
A4.4 EUREKA	EUR 0.40 million
A4.5 COST	EUR 43.40 million <i>broken down as follows:</i>
A4.5a COST: Baseline Contribution	EUR 30.00 million
A4.5b COST: Additional Contribution	EUR 13.40 million
A4.6 RSFF***	EUR 150.00 million
Total:	EUR 201.80 million***

* On condition that the draft budget for 2013 is adopted without modifications by the budget authority.

** ERA-NET and ERA-NET Plus actions are funded directly by the Themes.

*** EUR 150 million will come from a share of the third countries dedicated to the Cooperation Specific Programme, subject to the availability of credits.

Budget Figures in This Work Programme

All budgetary figures given in this work programme are indicative. The final budgets may vary following the evaluation of proposals.

The final budget awarded to actions implemented through calls for proposals may vary:

- The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

For actions not implemented through calls for proposals:

- The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions;
- The final budget awarded for all other actions not implemented through calls for proposals may vary by up to 10% of the indicated budget for these actions.

WORK PROGRAMME 2013

COOPERATION

Annex 5

RECOVERY PACKAGE

PUBLIC-PRIVATE PARTNERSHIP INITIATIVES⁴⁹:

- FACTORIES OF THE FUTURE (FOF)**
- ENERGY-EFFICIENT BUILDINGS (EeB)**
- GREEN CARS (GC)**

Annex 5 brings together for easy reference all the WP 2013 topics of the three PPPs from the different participating Themes: NMP, ICT, Transport, Environment and Energy.

⁴⁹ The Public Private Partnership Initiative on the Future Internet, launched in 2010, is outside of the context of the Recovery Package. It is described under Theme 3

Recovery Package: Public-Private Partnerships (PPPs) and Risk Sharing Finance Facility

The European Economic Recovery Plan adopted by the European Commission on 26 November 2008 and endorsed by the European Council on 11-12 December 2008 proposes actions to develop technologies for the manufacturing, construction and automotive sectors, which have recently seen demand plummet as a result of the crisis and which face significant challenges in the transition to the green economy. The Commission proposed to increase research financing through the RSFF instrument and to launch three Public-Private Partnerships (PPPs) which provide the required support to the three sectors:

- in the manufacturing sector: a 'Factories of the Future' initiative to help EU manufacturers across sectors, in particular SMEs, to adapt to global competitive pressures by increasing the technological base of EU manufacturing through the development and integration of the enabling technologies of the future, such as engineering technologies for adaptable machines and industrial processes, ICT, and advanced materials (EUR 1.2 billion);*
- in the construction sector: an 'Energy-efficient Buildings' initiative to promote green technologies and the development of energy-efficient systems and materials in new and renovated buildings with a view to reducing radically their energy consumption and CO₂ emissions (EUR 1 billion);*
- in the automotive sector: a 'Green Cars' initiative, involving research on a broad range of technologies and smart energy infrastructures essential to achieve a breakthrough in the use of renewable and non-polluting energy sources, safety and traffic fluidity (EUR 1 billion).*

These initiatives are part of a comprehensive, integrated package to be implemented in cooperation between all the responsible services within the Commission, complemented by actions on the demand-side, such as public procurement, technical standards, and regulatory measures. This includes a further EUR 4 billion for non-research activities under the Green Cars Initiative.

The three PPPs are intended to prevent the crisis from deflecting attention from the EU's longer-term interests and the need to invest in its future. Research and Innovation are considered as strategic and "smart" investments to prepare the ground for the future of the EU economy which has to become a knowledge-based and low carbon economy, as stated in the Europe 2020 strategy. This is crucial for the EU to come out from the crisis stronger, more sustainable and more competitive.

The Commission, working in close collaboration with industrial representatives, has developed multi-annual roadmaps and longer-term research strategies for the three sectors. The initiatives will continue to be implemented, through a series of Cross-thematic Calls and through dedicated topics, under the 2013 work programmes of the relevant FP7 Themes. Responsibility for these Cross-thematic Calls and dedicated topics is as follows:

- The 'Factories of the Future' initiative involves financial support from the NMP⁵⁰ and ICT⁵¹ Themes;*
- The 'Energy-efficient Buildings' initiative involves financial support from the NMP and Environment Themes⁵²;*

⁵⁰ Nanosciences, Nanotechnologies, Materials & New Production Technologies

⁵¹ Information and Communication Technologies

- *The 'Green Cars' initiative involves financial support from the ICT and NMP Themes (in two separate calls), as well as the Energy and Transport Themes (topics being part of broader calls in their respective work programmes).*

In addressing the industrial needs and objectives of each PPP, the Themes will work closely together to ensure a coherent, complementary and holistic approach. To ensure high visibility and to promote cooperation and exchange of information between the research projects funded under the different Themes, it is intended to gather the researchers and the industrial stakeholders together in annual cross-thematic workshops and seminars for each PPP. This would be part of the implementation of the projects.

The Call Fiches for the topics in the Green Car PPP implemented by NMP and ICT Themes are included in Annex 5, whereas the Call Fiches for the topics implemented by Energy and transport Themes can be found within the corresponding work programme chapter of each of the two Themes. The topics in the FoF and EeB PPPs are organised in two calls implemented in a coordinated way with a common deadline and the Call Fiches are included in Annex 5 and in the corresponding work programme chapter of some of the participating Theme. Each Theme will remain responsible for its own budget and for the implementation of the related topics.

The corresponding research topics for each PPP under the work programme 2013 are given in the following three sections V.1 to V.3.

The RSFF is one of the instruments that can provide support to projects emerging under the PPPs through loan funding. RSFF loans have already been provided to a number of automotive companies which invest in cleaner engines and technologies. Furthermore, for the Green Car PPP, the EIB provides funding either by the RSFF or the (European Clean Transport Facility (ECTF)).

In addition to the PPPs launched under the recovery package, a Public Private Partnership Initiative on the Future of the Internet is launched under Theme 3 "ICT – Information and Communications Technologies" of the Cooperation Programme. This FI-PPP focuses on the development of innovative open network and service platforms with generic common enablers serving a multiplicity of demand-driven use cases in "smart applications".

⁵² In addition, the coordinated Call on Smart Cities and Communities between the Energy and ICT Themes will contribute to the objectives of the 'Energy-efficient Buildings' initiative

V.1 "Factories of the Future" Public-Private Partnership (FoF) - Cross-thematic coordination between NMP and ICT

Manufacturing is still the driving force of the European Economy. Manufacturing activity in Europe represents approximately **21% of the EU GDP** and provides about **20% of all jobs** (more than 30 million) in **25 different industrial sectors**, largely dominated by **SMEs**. With each job on the factory floor generating approximately two other jobs in services, about 60 million people are additionally engaged in the related service areas. Therefore, manufacturing is of high importance to Europe, with a huge potential to generate wealth, jobs and a better quality of life. The long-term shift from a cost-based competitive advantage to one based on high added value requires that European manufacturing increases its technological base, building on the EU's excellent R&D in this domain, and develops a number of **enabling trans-sectoral production technologies**.

The *Factories of the Future PPP Initiative* aims at helping EU manufacturing enterprises, in particular SMEs, to adapt to global competitive pressures by developing the necessary enabling technologies to support EU manufacturing across a broad range of sectors. It will help European industry to meet the increasing global consumer demand for greener, more customised and higher quality products through the necessary transition to a demand-driven industry with lower waste generation and energy consumption.

The activities will concentrate on increasing the technological base of EU manufacturing through the development and integration of the enabling technologies of the future, such as engineering technologies for adaptable machines and industrial processes, ICT for manufacturing, and the novel industrial handling of advanced materials. The initiative will concentrate on industry-led R&D projects and will include demonstration activities, such as large-scale production-line demonstrators for validation and market applications. The partnership will work together to identify the R&D needs of manufacturing industry and in particular SMEs. In order to further ensure the PPP character of the initiative, a large part of the activities in the projects is expected to be performed by industrial organisations themselves. This initiative, being by nature **cross-sectoral** and including efforts to address the **needs of SMEs**, aims to transform Europe into a dynamic and competitive knowledge-based economy by delivering:

- A new European model of production systems for the factories of the future (e.g. transformable factories, networking factories of excellence, learning factories) depending on different drivers such as high performance, high customisation, environmental friendliness, high efficiency of resources, human potential and knowledge creation.
- ICT-based production systems and high quality manufacturing technologies capable of optimising their performance with a high degree of autonomy and adaptability for a balanced combination of high throughput and high accuracy production.
- Sustainable manufacturing tools, methodologies and processes that have the capability of cost-efficiently shaping, handling and assembling products composed of complex and novel materials.

The indicative budget for 'Factories of the Future (FoF)' is EUR 230 million in 2013, of which EUR 160 million is from the NMP Theme and EUR 70 million from the ICT Theme.

V.1.1 "Factories of the Future (FoF)" - Topics covered by the NMP Theme

FoF.NMP.2013-1 Improved use of renewable resources at factory level

Technical content/scope: A more efficient use, at factory level, of material and energy resources, while at the same time ensuring high productivity rates, has become a key issue for a sustainable manufacturing sector. In this regard, a more extensive integration of technologies related to renewable energy and material resources and an optimal re-use of air, water and scrap (or other waste) along the lifecycle of factories may become a valuable complement to current strategies for resources efficiency. The resources consumed in the production processes, including air and water, should be minimised and the energy efficiency should be optimised in a continuous and iterative manner.

This novel approach would allow European manufacturing companies to take a qualitative leap towards environmentally neutral factories where the production processes and systems will move towards reduced ecological footprints (e.g. near-to-zero carbon approaches), whilst ensuring competitiveness.

This strategy demands new concepts and solutions at factory level, both for existing and new production plants. Research activities should be multi-disciplinary and address all of the following areas:

- Methodologies and tools for eco-efficient design or re-adaptation of production facilities based on co-evolving product-process-production systems including the integration of technologies for energy scavenging and recovery.
- Seamless integration of renewable energy harvesting in production systems for high productivity and maximum energy efficiency in the factories.
- Simulation and optimisation tools for assessing both environmental and economic costs linked with the use of renewable materials and energy resources, as well as technologies for energy recovery with reliable predictive analytics to guide decision-making.

Standardisation, regulation and pre-normative research aspects should be considered. Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

The proposals should cover both research and demonstration activities. Prototypes and pilot implementations in real industrial settings represent a clear added-value. Whilst there is no lower or upper limit on the requested EU contribution, the target is that proposals allocate around 50% of the total eligible costs of the project (excluding management costs) to demonstration activities and this objective will be taken into account in the evaluation under the criteria S/T Excellence and Impact.

Projects are expected to use appropriate Life Cycle Assessment techniques in order to estimate the impact of energy efficiency and improved use of renewable materials and energy resources on the price of final products. Projects are also expected to generate knowledge to support European policy development and promote standardisation (at national or international level).

Funding scheme: DEMO-targeted collaborative projects.

Expected impact:

- In economic terms, reduction of 20% in the total lifecycle costs of factories with respect to conventional factories of similar productivity rates, due to an increase in energy efficiency and improved use of renewable resources.
- In environmental terms, a major step towards zero-carbon footprint manufacturing systems and processes, with drastic reduction of total lifecycle environmental impacts.
- Strengthened global position of European manufacturing industry through the introduction of the new technologies related to an improved use of renewable resources and contributions to international standardisation.
- Strong support for eco-labelling policies and standardisation.

FoF.NMP.2013-2 Innovative re-use of modular equipment based on integrated factory design

Technical content/scope: Current markets and customer demands impose quick changes in terms of product models, with smaller lot sizes and increased variety. Moreover, with increased customisation, multiple similar products are produced in small lots in a shared production line as a result of just-in-time production. Therefore, for the economic sustainability of the production systems, an innovative re-use of modular equipment based on integrated factory design methodologies needs to be addressed. This requires a cost-efficient and modular approach for production systems, with a higher standardisation level regarding production equipment and components, allowing a highly flexible and reconfigurable production in the long term.

Research activities should address at least the first two of the following areas:

- Proactive modularisation and re-use strategies for the development of the future machinery and production systems and their integration in old, new or renewed factory facilities.
- Innovative factory lay-out design techniques able to integrate new approaches to leverage all potential synergies between the concurrent design of plant and processes, taking into account best practices for de-manufacturing, dismantling, recycling and value-chain extension.
- Flexible, low-cost assembly/disassembly solutions to aim at a high market penetration with those solutions by the machine component suppliers and systems integrators, by developing low weight and mobile solutions (e.g. flexible grippers), as well as systems (e.g. automation, vision and control) for their seamless integration in factories.

Standardisation, regulation and pre-normative research aspects should be considered. Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

The proposals should cover both research and demonstration activities. Prototypes and pilot implementations in real industrial settings represent a clear added-value. Whilst there is no lower or upper limit on the requested EU contribution, the target is that proposals allocate around 50% of the total eligible costs of the project (excluding management costs) to demonstration activities and this objective will be taken into account in the evaluation under the criteria S/T Excellence and Impact.

Projects are expected to use appropriate Life Cycle Assessment techniques and to generate knowledge to support European policy development and promote standardisation (at national or international level).

Funding scheme: DEMO-targeted collaborative projects.

Expected impact:

- Cost reduction of around 30% due to re-use of existing modular equipment when setting-up production systems for new product variants.
- Set-up and ramp-up time reduction of around 30% for new or retrofitted plant designs.
- At the end-of-life stage, a step contribution towards a 100% reuse of production system components in new life cycles.
- Strengthened global position of European manufacturing industry through the introduction of the new technologies related to an innovative re-use of equipment based on integrated factory design and contributions to international standardisation.

FoF.NMP.2013-3 Workplaces of the future: the new people-centred production site

Technical content/scope: The workplaces of the future will give much more importance to the human dimension. Putting people at the centre of future factories will provide a stimulating environment for the employees, and make the most from their knowledge, skills and cultural background, in particular through life-long learning and training. Those new workplaces should effectively be integrated into the social (e.g. urban/rural) environment in order to sustainably respond to the needs of the citizens (e.g. quality of air, level of lighting and noise, traffic congestions, etc.) and, at the same time, provide extended services to the workers in terms of safety, accessibility, inclusiveness, efficiency and work satisfaction.

This approach would lead European manufacturing industry to make a qualitative leap towards new people-centred and knowledge-based production workplaces which take into account the constraints of the work force, for example those of aged workers. The workplaces of the future should, therefore, be based on methodologies for enhancing flexible, safe and smart production where adequate levels of automation are applied, while maintaining a level of employment with highly satisfied and skilled workers and, at the same time, ensuring competitiveness.

This strategy demands new concepts and solutions at factory level, both for existing and new production plants. Research activities should be multi-disciplinary and address several of the following areas:

- New approaches to integrate the European factories of the future in their social (urban/rural) environment including urban transport, parking, shopping and entertainment centres, support to families, etc.
- New methods and technologies for an optimised use of workers' knowledge and cognitive capabilities (e.g. for data acquisition, transmission, handling and post-processing), for the stimulation of team interactions and to enhance work related satisfaction, in order to achieve a more human centred and safe workspace, e.g. through the use of knowledge management and decision making systems which are better designed to access, capture and share know-how.
- New methods and technologies for enhanced cooperation of the human operators and the production systems (e.g. Human Factors Engineering), in a safe, flexible and dynamic way, to carry out tasks interactively. New models for human/system integration taking into account the skills, capabilities, and knowledge of the human operator early in the production system design process. New methods and

technologies for efficient human/human interaction and team collaboration, to enhance joint decision-making and team-based efficiency.

- New approaches related to safety and ergonomics of the working areas by the optimisation and personalisation of working environment parameters (e.g. indoor/outdoor lighting, temperature, and humidity) and the integration of advanced safety systems, taking into account worker's age, experience and physical condition, and workers interactions.
- Methodologies and tools for people-centred production to guarantee an efficient transition from current to future worker task/role definitions and multi-skilled involvement of individual workers with expanded responsibility in broader sets of operations (e.g. maintenance, logistics, and quality control).

Screening of existing national/international standards (e.g. safety regulations) and of the needs for new standards is required. Other standardisation, regulation and pre-normative research aspects should also be considered.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

This topic is particularly suitable for collaboration at international level, particularly under the IMS scheme⁵³. Project partnerships that include independent organisations from at least three IMS regions⁵⁴ are therefore encouraged.

Funding scheme: Small or medium-sized collaborative projects.

Expected impact:

- In economic terms, an increase of above 20% in the productivity rate due to an enhanced use of human resources, reduction of costs related to accidents and occupational diseases, reduction of absenteeism in the workplace and by increasing the pool of potential workers through widening the skill profile.
- In environmental terms, a more friendly integration of the factory in the social environment, with drastic reduction of total environmental impacts.
- In social terms, a reduction in the number and severity of work accidents and diseases, an improvement in the working conditions in factories and in the attractiveness of the working environments for the right-skilled people due to knowledge-based ergonomic approaches to manufacturing.

FoF.NMP.2013-4 Innovative methodologies addressing social sustainability in manufacturing

Technical content/scope: In order to ensure the social well-being of people in the factories of the future, there is a need to redefine the human role in manufacturing.

New forms of interaction between process, machinery and human beings need to be addressed in such a way that future factories can be operated profitably, and at the same time provide a stimulating environment for the employees, and make the most from their skills and

⁵³ IMS (Intelligent Manufacturing Systems) is an industry-led, global, collaborative research and development programme, started in 1995 as the world's only multilateral collaborative R&D framework: www.ims.org

⁵⁴ The current member regions of IMS are the European Union, the United States of America, Korea, Mexico and the EFTA states of Norway and Switzerland.

knowledge through life-long learning. On the basis of these new interactions, manufacturing jobs need to be re-defined and re-engineered and new roles for people in the factory need to be introduced. Cross-discipline studies are needed in order to explore profitable business approaches where the social element in sustainability can be a key factor to ensure midterm economic success while maintaining a high level of employment, even in a period of crisis.

Those business approaches may require an adaptation of organisational structures and management strategies to take into account social sustainability requirements.

Developments in this area are expected to lead to:

- Work satisfaction of employees within the factories of the future.
- New profitable business approaches benefitting from the relevance given to the importance of social sustainability.
- Sustainable use of human capital (e.g. staff knowledge) in the factories of the future.

Within this context, this Support Action should deliver an assessment of relevant past and current activities in Europe (and worldwide) towards the achievement of social sustainability in manufacturing, a set of recommendations on how social sustainability can be measured and enhanced, a definition of what is necessary to support this in terms of research, i.e. a future research roadmap on relevant S&T themes, a definition of the conditions in a factory and /or in society that are favourable for this purpose, and a relevant pilot case.

Additional eligibility criterion: The requested EU contribution must not exceed EUR 500 000 per project, and the project duration must not exceed 18 months.

Funding scheme: Coordination and Support Actions (Support actions). No more than one support action will be funded.

Expected impact:

- Improved understanding of the current situation and future perspectives for social sustainability in European manufacturing.
- Improved synergy among stakeholders around Europe, and community building for future take-up actions.
- Facilitation of a structured approach to promote social sustainability for the European factories of the future.
- Improved production and consumption strategies in line with the societal challenges foreseen by the Europe 2020 strategy.

FoF.NMP.2013-5 Innovative design of personalised product-services and of their production processes based on collaborative environments

Technical content/scope: New product-services go nowadays beyond the physical and service oriented concept, since they are designed in order to be always connected, self-learning, adapting and intelligent. In order to generate economic growth, manufacturers should focus on delivering *solutions* for customer needs rather than simply *products* (or product-services) for their customers. Therefore, new business opportunities will be generated when providing increased added-value to users by integrating personalised innovative functions into traditional and high-tech products.

This business challenge can be addressed by embedding more and more knowledge in highly-personalised innovative product-services (i.e. the so called Meta Products). These novel products are expected to be self-innovative and become smarter while ensuring simplicity for users. They will be upgradable through software applications or hardware module

enhancement, which extend their lifespan, and reduce the environmental impact. In addition, they will provide improved value-added services for a wide range of users, but with personalisation aspects so as to consider individual demands. Meta Products will therefore require the use of new, interoperable, self-organising and collaborative design methodologies and systems. Product development should take place through a collaboration within the product ecosystem, involving multiple companies and actors, in order to offer the high-value personalised product-services to users.

On the other side, new product design and development is fully linked to the concurrent design of the related manufacturing processes, equipment and facilities, including plant layout. This need has a strong influence on several aspects related to the life-cycle of both the product and its manufacturing processes (e.g. costs, production, disposal, environmental footprint). Meta Products will be capable of providing advanced service solutions along the whole customer value chain (from the product acquisition to the product dismissal), integrating personalised design, sustainable production, efficient distribution, after sale services, as well as foreseen recycling and re-manufacturing. Cost-effective design solutions with high potential in terms of eco-design content (i.e. minimal footprint impact along the product life-cycle) leading into a new technological cycle (i.e. cradle to cradle concept), should aim at the simultaneous life-cycle optimisation of product-services and related processes.

Research activities should focus on several of the following areas:

- Methodologies and systems for cross-sectoral collaborative design (e.g. 3D drawings, simulation models) enabling the seamless connection and use by all the stakeholders (e.g. product designers, service providers, users) involved in the Meta Product life cycle.
- Collaborative design tools to support the development of Meta Products based on Service Oriented Architecture (SOA). They should be able to connect the design of the product hardware with the development of the software related to the embedded services, based on open source software applications.
- Novel approaches for embedding knowledge into product-services (e.g. use of smart materials, tracking systems, sensing and interacting technologies) in order to add more personalised innovative functions into traditional and high-tech products.
- Embedded tools for product adaptability to enable Meta Products to store usage behaviour and utilise the data to re-organise the embedded services. Feedback mechanisms should be integrated within the tools and should provide the data to the networked companies involved in the design, manufacturing and service-related operation of the Meta Products.
- User-oriented simulation systems (e.g. virtual reality, reverse engineering) for product-service modelling and production-related decision-making approaches (e.g. requirements identification by means of the demand market and user-perceived quality analysis), covering the needs all along the life-cycle.

Standardisation, regulation and pre-normative research aspects should be considered. Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

Projects are expected to use appropriate Life Cycle Assessment techniques and generate knowledge to support European policy development and promote the standardisation (at national or international level).

Funding Scheme: Large-scale integrated collaborative projects.

Expected impact:

- Increased ability to rapidly follow the market dynamics by means of fast production and delivery of personalised final products
- Cost reduction of around 30% by decreasing lead times in product/process development.
- Set-up and ramp-up time reduction for new processes and plant designs (30%).
- Reduction of around 40% in the environmental footprint and the resources consumption during the production and use phases of the Meta Products, together with an increased use of more environment-friendly materials.

FoF.NMP.2013-6 Mini-factories for customised products using local flexible production

Technical content/scope: Product customisation on functional and aesthetic aspects is a common trend to different market segments (e.g. fashion and interior furnishing, sport and leisure, metal working, bio-medical and safety-related products). Advanced production equipment and innovative systems are needed to enable ultra-fast and cost-effective manufacturing of fully customised products on the spot and exactly at the required time. Innovative production solutions should be developed to bring manufacturing operations closer in time and space to the final customer, eventually exploring the possibilities of moving from batch to continuous flow manufacturing. In addition, new factory concepts need to be developed, such as on-site factories or factories-in-a-container, which provide instant manufacturing and customisation services locally, for example in retail environments or utilisation sites.

Those mini-factories, addressing adaptation to customer needs at or near the point of sales or use, will be characterised by fast ramp-up, small environmental footprint and reusability, and will be easy to handle and to set-up. Those production systems should also include new technologies for supply chain management, product distribution and direct end-user interaction.

Research activities should focus on some of the following areas:

- Scale reduction and increased flexibility of production systems in order to satisfy the special requirements of the local flexible mini-production units, which have to show a competitive advantage compared to the traditional larger factories in terms of space, complexity and operator skills.
- Adaptive control and auto-configurable automation systems for local flexible production with high customisation capabilities, where manufacturing operations and sequences need to accommodate to the highly unpredictable customer demands.
- New and integrated product/process engineering solutions, including CAD-CAM systems, able to automatically adapt product features to specific customer demands and accordingly configure processes and machines for local production.

Standardisation, regulation and pre-normative research aspects should be considered. Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

The proposals should cover both research and demonstration activities. Prototypes and pilot implementations in real industrial settings represent a clear added-value. Whilst there is no lower or upper limit on the requested EU contribution, the target is that proposals allocate around 50% of the total eligible costs of the project (excluding management costs) to demonstration activities and this objective will be taken into account in the evaluation under the criteria S/T Excellence and Impact.

Funding scheme: DEMO-targeted collaborative projects.

Expected impact:

- Increased ability to rapidly follow the market dynamics by means of fast production and delivery of customised final products.
- Reduction of the time to market by 50%.
- Cost reduction (around 30%) by decreasing lead times in product and process development.
- Reduced environmental impact per produced unit compared to traditional larger factories.
- Set-up and ramp-up time reduction (around 30%) for new processes and plant designs of the mini-factories.

FoF.NMP.2013-7 New hybrid production systems in advanced factory environments based on new human-robot interactive cooperation

Technical content/scope: The future factory environments for manufacturing, and in particular assembly/disassembly operations and auxiliary processing such as lifting and moving of heavy goods, will radically improve by integrating new forms of interaction between process, machinery and workers in such a way that future factories can be operated profitably and make the most from employees' knowledge and skills. Hybrid production systems, where robots physically interact with humans, need to ensure an intuitive and safe cooperation among them and an enhanced awareness of the work conditions and the constraints imposed by the factory environment.

A new generation of production systems (e.g. machinery as well as industrial and service robots) will maintain the competitive advantage of the European manufacturing sectors. Future machinery and robots will be based on intelligent features, increasing flexibility in a totally safe environment, enhancing the use of this advanced equipment in a cooperative way with their human operators (machine/robot-human and machine/robot-robot interactions), as well as on self-learning functionalities that allow them to be aware of the current and future tasks.

Research activities should focus on at least three of the following areas:

- Technologies for a reliable and safe machine/robot-human and machine/robot-robot interactive cooperation in applications where the equipment will carry out the tasks which provide power, repeatability and extended work-space while the human operators will provide accuracy, flexibility and problem solving capacity.
- Methodologies for the improved planning of the shared tasks, based on analysis and simulation of real-time collaboration at the production site and by the user-friendly programming of complex tasks, using information from factory sensor networks, and taking into account the constraints from factory environments in predefined automatic

or semi-automatic assembly/disassembly operations, e.g. using advanced real-time augmented reality in complex operations.

- Novel methods of programming for fast-teaching and guided-learning in order to adapt robot work tasks dynamically during operation to the changeable production requirements (e.g. in hybrid assembly of serial products such as automotive, white goods, airplanes, where frequent changes of production require regular updates of the assembly tasks as well as adjustment of workplaces, fixtures and tools).
- Technologies on mobile robots for improved intra-factory logistics, based on enhanced safe navigation in non-structured environments. Dynamic planning methodologies, coordination control and path reconfiguration strategies, taking into account wireless communication, in a safe interaction with operators have to be addressed.

The human-robot safety features, enabling production operation in workspaces shared with humans without separating safety fences or in direct human-robot operations, should lead to advances in the certification of the related production systems working in industrial environments and in the characterisation of risks and safety systems.

Screening of existing national/international standards (e.g. safety regulations) and of the needs for new standards is required. Other standardisation, regulation and pre-normative research aspects should also be considered.

Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

Funding Scheme: Large-scale integrated collaborative projects.

Expected impact:

- Increasing use of robot installations in manufacturing. Today, only some 15% of robot automation potential is being exploited. Further improvement in robot exploitation will contribute to higher employment as more manufacturing capacity will remain in Europe.
- Increasing adaptability of advanced factories by combining the flexibility inherent to humans with the enhanced potential of cooperative production systems, maintaining reduced investment costs and allowing a wide use of those systems in new production areas and sectors, particularly SMEs.
- Promotion of equal opportunities on the shop-floor in terms of gender, age and skills, due to less physically demanding jobs in manufacturing and improved working environment and including accessibility for programming and use.

FoF.NMP.2013-8 Innovative strategies for renovation and repair in manufacturing systems

Technical content/scope: Extending the life and performance of manufacturing equipment as well as designing for re-use/upgrade or ease of renovation (including functional/technological upgrade) and repair requires innovative methodologies which may include Life Cycle

Assessment (LCA) and smart devices based on ICT or advanced materials. Design and manufacturing of plants and equipment which integrates renovation, refit and repair strategies (including upgrade for the enhancement or lifetime extension of equipment) as well as increased ability to track equipment use should be simultaneously addressed to optimise the life cycle of production systems.

Research activities should focus on several of the following areas:

- Renovation and repair approaches for manufacturing plants and equipment including the design phase and life-cycle evaluation.
- Use of existing smart devices and systems based on ICT or advanced materials in the renovation and upgrade of existing structures.
- Repair, upgrade, re-manufacturing and re-assembly processes (including replacing modules by less energy-consuming ones) in the in-situ renovation of infrastructures.
- Systems providing (self) monitoring and diagnostic tools to manage plant and equipment usage and addressing maintenance/renovation/repair or substitution needs.
- Mathematical methods and algorithms for failure mode detection and component degradation assessment.
- New engineering methodologies and supporting tools for machinery recovery and re-use approaches for substituted components.

Standardisation, regulation and pre-normative research aspects should be considered. Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

Projects are expected to use appropriate Life Cycle Assessment techniques and to generate knowledge to support European policy development and promote the standardisation (at national or international level).

Funding Scheme: Large-scale integrated collaborative projects.

Expected impact:

- In terms of economic sustainability, reduction of around 20% of renovation and repair costs, through a better condition-based monitoring and condition-based substitution and repair.
- In terms of environmental sustainability, recovery of at least 80% of the substituted materials for its re-use.
- In terms of social sustainability, eventual elimination of hazardous materials and renovation of outdated plants and structures.

FoF.NMP.2013-9 Advanced concepts for technology-based business approaches addressing product-services and their manufacturing in globalised markets

Technical content/scope: In order to remain on the leading edge and to extend their shares in future global markets, European companies need to offer new user-oriented higher value-added solutions, with appropriate global service infrastructures. Moreover, the decreasing

lifecycle times of products and the increasing number of variants require the design and operation of assembly plants and production networks that are fully flexible, i.e. capable of switching production from one model to another to meet the fluctuating and diverse demand.

Therefore, advanced holistic concepts for technology-based business approaches are needed, in order to help European global enterprises to dynamically operate at multiple locations around the world in a volatile economic environment, taking into account local resources such as commodities, energy, labour, etc. Such global business approaches should include emerging technologies and innovative manufacturing systems and methods, in order to enable European companies to offer their customers a broader variety of affordable products and an extended range of services.

These innovative concepts should provide a fast and efficient response to market variations and should be easily adaptable to the requirements of other industrial sectors. They should support the transition of a European manufacturing enterprise from a traditional product-based approach to a global-minded approach, in which a complex network of actors (mainly SMEs) is able to provide a customised product-service solution to each final customer in the global market. Such a global approach should define standardised formats and interfaces, models and procedures for planning and running fast, integrated, flexible and scalable manufacturing related activities for product-services, using a global supply chain.

Research activities should focus on all of the following areas:

- Technological concepts to address economic and risk assessment in order to support decision-making in the early design of the manufacturing systems, in particular for the integration of new complex technologies in the factory.
- Interactive, model-based decision-making processes for business management, able to assess the impact on performance of alternative configurations of the network of actors involved in the global supply chain for product-services and related production systems.
- Methodologies and tools to manage the co-evolution of products-services and the related production systems in the framework of innovative business approaches.

Screening of existing national/international standards (e.g. safety regulations) and of the needs for new standards is required. Other standardisation, regulation and pre-normative research aspects should also be considered.

Projects are expected to use appropriate Life Cycle Assessment techniques and to generate knowledge to support European policy development and promote the standardisation (at national or international level).

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

This topic is particularly suitable for collaboration at international level, particularly under the IMS scheme.⁵⁵ Project partnerships that include independent organisations from at least three IMS regions⁵⁶ are therefore encouraged.

Funding scheme: Small or medium-sized collaborative projects

⁵⁵ IMS (Intelligent Manufacturing Systems) is an industry-led, global, collaborative research and development programme, started in 1995 as the world's only multilateral collaborative R&D framework: www.ims.org

⁵⁶ The current member regions of IMS are the European Union, the United States of America, Korea, Mexico and the EFTA states of Norway and Switzerland.

Expected impact:

- Cost savings of around 30% in production due to improved scheduling and to more robust manufacturing methods.
- Higher reactivity to customer needs around 40% as result of real time adaptable business approaches which include proper legislation monitoring.
- Increased robustness of the supply network around 30%.
- Product-services and their manufacturing processes which are more environment-friendly at global scale.

FoF.NMP.2013-10 Manufacturing processes for products made of composites or engineered metallic materials

Technical content/scope: Products made of composites or engineered metallic materials are becoming more popular in many industrial sectors due to the increased capabilities of design techniques which are able to simulate material properties with a high level of accuracy and, therefore, to optimise the exploitation of their improved properties. Increasingly challenging demands continue arising from market and society in terms of better functional properties, weight reduction, cost decrease, compact design, and minimal carbon foot-print. Composites and engineered metallic materials are now used in many products, either as standalone components or embedded reinforcements in order to locally provide their specific performance in terms of enhanced mechanical properties. An extensive use of such materials leads to significant product improvements that cannot be achieved with the traditional metals or polymers.

However, the processes for manufacturing such products require a better understanding and further optimisation in order to ensure the required quality for the specific applications and a high productivity rate for cost-efficient manufacturing. Production technologies for composites and engineered metallic materials include casting, forming, removal and additive processes related to 3D metals, sandwich materials, multi-materials, new metallic alloys, thermoplastics or composite laminates.

Research activities should focus on several of the following areas:

- Innovative methodologies and technologies for manufacturing which are capable of producing and post-processing new engineered metals and composites taking into account the needs for specific applications.
- Systems and devices to monitor and optimise the process parameters for these new materials to be produced and post-processed at industrial scale.
- New technologies for joining and assembly of multi-materials components (e.g. metal/composite, polymer/composite, and engineered metallic/composite) based on enhanced understanding of the material-interface behaviour at micro/nano scale.
- Characterisation and testing techniques to evaluate the performance (e.g. quality, throughput rate, robustness) of the manufacturing processes for products made of new materials.
- Development of product repair technologies and methodologies to assess the repair feasibility of the manufactured product and to ensure repeatable, safe and certified repair procedures.
- Recycling technologies and routes that guarantee a minimal environmental foot-print of the products made of the new materials at the end of their life.

Screening of existing national/international standards (e.g. safety regulations) and of the needs for new standards is required. Other standardisation, regulation and pre-normative research aspects should also be considered.

Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

Funding scheme: Small or medium-sized collaborative projects.

Expected impact:

- Higher utilisation of advanced materials in products with improved performance without a cost increase.
- Decrease in raw materials and energy consumption by at least 20% during the processing, manufacturing and/or dismantling phases.
- Reduction of waste and emissions (e.g. fumes, chemicals, dust, hazardous materials) by at least 30% during the processing, manufacturing and/or dismantling phases.

FoF.NMP.2013-11 Manufacturing of highly miniaturised components

Technical content/scope: Product miniaturisation requires a good understanding of the intended application, the scale-related property variation, the manufacturing methods and the material behaviour. Miniaturisation has been an increasing trend in the last 15 years because of the drive for minimisation of energy and materials use in manufacturing processes, the increased need for redundancy, the requirements of faster and more energy-efficient devices, and the enhanced functionalities (such as selectivity and sensitivity).

Micro-fabrication techniques are widely exploited by the semiconductor industry, which has invented many micro- and nano-scale manufacturing methods. These methods could be regarded, in general, as potential techniques for the miniaturisation of components in many other industry sectors. However, they are mostly addressing a particular class of materials and 2D surfaces with specific features, and are highly sophisticated and expensive (high cost of ownership).

Alternative manufacturing technologies are currently needed to overcome the challenges of volume production of miniaturised components or sub-components made of a wide range of materials (e.g. metallic alloys, composites, ceramic and polymers). These techniques should be cost-efficient and flexible in terms of both the shapes of the features and the materials being used. In order to reach this objective in a competitive way, the upgrading of appropriate high-throughput and cost-efficient processes like conventional forming, moulding, imprinting and surface deposition processes, or new integrated process chains, will be needed. New materials pose new challenges for cost-efficient manufacturing in order to shape, handle and assemble complex structures that can involve macro-micro-nano scale features and may require the analysis of the micro-structural behaviour of materials and its interaction with the production process.

Research activities should focus on at least three of the following areas:

- Processing techniques for miniaturised components made of a wide range of materials with different properties (e.g. thermo-responsive, piezoelectric, or phase-change materials), in order to achieve a flexible and high-throughput production.
- Integration of multiple material combinations and smart materials for the sensing and actuation technologies.
- Merging the top-down and bottom-up approach in order to go into parallel and/or continuous manufacturing.
- Novel on-line monitoring and quality inspection systems in manufacturing of highly miniaturised components, in order to ensure efficiency, reliability and high product quality.

Projects are expected to address issues like energy savings, cost and waste reduction, and recycling that should be studied through Life-Cycle Assessment.

Projects should show substantial improvements in the manufacturing of components at the micro and nano-scale in terms of cost/performance balance (e.g. lower costs per integrated function), accuracy and reproducibility by providing the appropriate cost-efficient and reliable manufacturing technology.

Screening of existing national/international standards (e.g. safety regulations) and of the needs for new standards is required. Other standardisation, regulation and pre-normative research aspects should also be considered.

Proof of concept in terms of at least one demonstrator should be delivered before the end of the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure an efficient implementation and maximum impact of SME-related activities, the leading role of SMEs with R&D capacities will be evaluated under the criteria Implementation and Impact: the coordinator does not need to be an SME but the participating SMEs should have the decision making power in the project management; and the output should be for the benefit of the participating SMEs and the targeted SME dominated industrial communities.

Funding Scheme: SME-targeted collaborative projects.

Expected impact:

- Improved high-throughput and/or highly flexible and cost-efficient processes for micro/nano-manufacturing of components for application areas such as tools, electrodes, solar cells, consumer products, and communication and medical devices.
- Scaling up of micro-production processes from lab-scale to an industrial scale for multifunctional applications such as in medicine, energy, transport and electronics.
- Further progress on micro/nano-manufacturing towards intelligent, scalable and adaptable systems, enabling the cost-efficient, competitive and market-demand-targeted production, ranging from small/medium volumes to high throughput and thus facilitating the access to target markets characterised by small or growing volumes.

V.1.2 "Factories of the Future (FoF)" - Topics covered by the ICT Theme

– Objective FoF-ICT-2013.7.1 Application experiments for robotics and simulation

All projects under this objective shall carry out a critical mass of vertical application experiments related to robotics or simulation, complemented by horizontal support services: Driven by the requirements of first-time users, individual experiments shall bring together all actors of the value chain necessary to equip new users with novel products or services and assist them in customising and applying these in their respective environments, e.g. first time users, application experts, technology suppliers, system integrators, and service providers. Special emphasis is on SMEs, both on the supply and the demand side. Proposers are referred to the general description of take-up actions in the introduction to this Challenge.

Target outcomes:

a) **Robot solutions for new manufacturing applications**

Experiments shall showcase the take-up, integration and evaluation of methods, components, and tools reflecting the paradigm shift in industrial robotics, away from immobile, large-sized, pre-programmed robots to more flexible, energy efficient and adaptable service robots (e.g. lightweight, mobile systems). Experiments should target key functionalities such as mobility, reconfigurability, dexterity, safety and human-robot interaction, and focus on downstream activities like systems integration, testing and validation under realistic manufacturing conditions. In areas such as manufacturing, service, maintenance and repair, or monitoring and control, application scenarios must be well motivated in technical terms and exploitation potential. Experiments shall be innovative, e.g. in terms of integrating new materials, advanced sensors and control technologies in robotic systems.

b) **Simulation services for engineering and manufacturing**

Experiments shall showcase the customisation and adoption of HPC-cloud-powered simulation services by users, particularly SMEs. Innovation shall be addressed at three levels: (1) Users get a "one-stop-shop" access to simulation technologies novel for them, including expertise and tools for visualisation, analytics, customisation and integration; and dynamic, easy and affordable access to computing resources; (2) as business owners, independent software vendors and simulation service providers, supported by competence centres, port their applications to a cloud of HPC resources and run experiments with those cloud-based service and business models in controlled environments; (3) HPC resource and service providers join forces in providing, across experiments, a prototype of a sustainable European commercial cloud of HPC resources in manufacturing and engineering including the necessary orchestration and access services. An operational prototype of the targeted cloud infrastructure is expected to become operational at an early stage. HPC-cloud providers shall build on existing infrastructures as far as appropriate.

c) **Constituency building and road-mapping:**

Building constituencies and developing broad research and innovation agendas in areas such as (i) analytics, simulation, and forecasting technologies deployed in manufacturing and engineering; (ii) architectures and services integrating agile and flexible manufacturing processes into distributed, interoperable, "green", and context aware enterprises of the future.

Expected impact:

- Strengthen European SMEs in manufacturing to adopt advanced robotics and simulation technologies towards improving their global competitiveness in terms of innovative, high quality products and services at affordable manufacturing costs and prices.
- Strengthen European technology and service providers by further opening to them the SME market in the manufacturing sector and by giving them the opportunity to experiment with new business models.
- Furthering the adoption of cloud infrastructures in Europe in a large niche market segment important for Europe's economy.

Funding schemes:

- a), b): IP – it is expected that minimum one IP is supported for each target outcome.
c) CSA

Objective FoF-ICT-2013.7.2: Equipment assessment for sensor and laser based applications

All projects under this objective shall carry out a critical mass of equipment assessment experiments related to laser or sensor-based tools: Suppliers of innovative high-tech equipment install and assess their prototypes or products in production-like environments and validate them in established or dedicated manufacturing lines. The primary aim is to strengthen the ICT equipment supplier base, predominantly SMEs, through a close cooperation with globally acting manufacturers, by improving the manufacturing processes in relation to quality, speed, environmental and resource efficiency. Equipment assessments require the following steps: (i) definition of state-of-the-art requirements for a specific application scenario; (ii) establishment of productivity metrics and (iii) assessment of experiences and results. Special emphasis is on SMEs on the supply side. Proposers are referred to the general description of take-up actions in the introduction to this Challenge.

Target Outcomes

- a) **Intelligent equipment solutions in custom manufacturing and/or re-manufacturing: Equipment assessment** of sensor-/actuator-driven equipment targeting smart production flexibly through an effective monitoring and control of small volume, small lot size customisation requirements and/or end-of-life manufacturing operations – such as dismantling, recycling, material reuse. The assessment framework shall address improvements related to precision, speed, cost, flexibility and efficiency of (re-) manufacturing operations.
- b) **Innovative laser applications in manufacturing: Equipment assessment** of all equipment relevant to laser manufacturing such as the laser itself, power supplies, handling tools, beam guiding/manipulation and quality, sensors to monitor the equipment and manufacturing process, periphery in general (materials, housing, safety issues etc). The assessment framework shall address improvements related to quality, speed, flexibility and resource efficiency of laser-based manufacturing and processing.
- c) Establish a network of **innovation multipliers** in the manufacturing sectors across all take-up projects of this Challenge taking an interdisciplinary approach to achieve broader technological, applications, innovation, and regional coverage thereby maximising impact and addressing better the needs of SMEs.
- d) Support a rapid **build-up of new manufacturing skills**: training methodologies and ICT-based tools to attract the interest of young talents in manufacturing and engineering.

Expected Impact

- Penetrate new application areas (e.g. high customisation, end-of-life product engineering and manufacturing), close to the market and opening new markets
- Strengthen supply-side SMEs by enabling them to supply manufacturers with new equipment and components for improved manufacturing operations.
- Leveraging innovation capacity and competitiveness of European producers of laser manufacturing equipment and their suppliers, in particular SMEs, and of the users of such equipment.

Funding schemes:

a), b): IPs – it is expected that minimum one IP is supported for each target outcome.

c), d) CSA

V.2 "Energy-efficient Buildings"- Public-Private Partnership (EeB) - Cross-thematic coordination between NMP and Environment (including Climate Change)

The construction industry accounts for more than 10 % of the EU's GDP and employs 32 million people in large, medium and small enterprises (direct and indirect employment). The construction sector is the highest contributor to the emission of Green House Gases with an average value estimated in most developed countries at close to 33%, knowing that around 40% of the total energy use corresponds to buildings, while their fossil-fuel heating represents a major share. Therefore, in the near future, the built environment in Europe needs to be designed, built and renovated with much higher energy efficiency. In order to achieve the objectives of the Energy Policy for Europe adopted early in 2007 and to contribute through Energy-efficient Buildings to the 20% reduction of energy consumption, 20% use of Renewable Energy Sources and 20% reduction of CO₂ emissions, a strong and continued effort in RTD and innovation in the short, medium and long term is needed.

The objective of the *Energy-efficient Buildings PPP Initiative* is to deliver, implement and optimise building and district concepts that have the technical, economic and societal potential to drastically reduce energy consumption and decrease CO₂ emissions, both in relation to new buildings and to the renovation of existing buildings. This new initiative should have a large payoff, as it will increase the market for energy-efficient, clean and affordable buildings. Research priority will be given to delivering new building materials and components for energy saving and energy generation, thermal energy storage systems, advance insulation systems, thermal distribution systems, lighting technologies, windows and glazing technologies, energy generation systems based on renewable sources, but also to reliable simulation and prediction tools, including assessment methods that integrate economical, social and environmental issues. To date, the construction industry has failed to effectively integrate key technologies into its operations in order to achieve sustainable, long-term competitiveness.

The aim of the activities is to identify, through the partnership with industry, the main RTD needs, and address a number of areas of clear industrial interest, such as tools, the building envelopes, systems and equipment, ICTs for energy efficiency, environmental technologies, social and behavioural aspects, standardisation and business models. Specific deliverables expected for new and refurbished buildings (including cultural heritage) are:

- Research for new design and manufacturing technologies, focussing on new building materials and components, thermal energy storage systems, advanced insulation systems, thermal distribution systems, lighting technologies, windows and glazing technologies, and assessment methods which include guidelines/methodologies for the eco-design and the Life Cycle Assessment of energy-efficient buildings.
- Research on ICT for energy efficiency in buildings, such as design and simulation tools, inter-operability/standards, building management systems, smart metering and user-awareness tools.
- Research on resource efficiency (waste and energy use) to identify best practices to help set standards and establish public policies for higher energy efficiency and reduced environmental impact.
- Research on the application of technological, design and organisational improvements at district-level with the aim of reducing the energy and resource consumption.
- Research-related activities on key demonstration topics concerning integration of innovative products and systems, grid issues and business models.

The indicative budget for 'Energy-efficient Buildings (EeB)' is EUR 116 million in 2013, of which EUR 110 million is from the NMP Theme and EUR 6 million from the Environment Theme.

The topics of the EeB initiative also support the Smart Cities Scheme, whose main call is FP7-SMARTCITIES-2013.⁵⁷

In addition, the topics FP7.ENERGY.2013.8.8.1 and FP7-ICT-2013.6.4 under the coordinated call on Smart Cities and Communities between the Energy and ICT Themes will contribute to the objectives of the EeB Public-Private Partnership Initiative. The indicative budget for the Smart Cities call contributing to the EeB objectives is EUR 209 million, of which EUR 114 million is from the Energy Theme, and EUR 95 million from the ICT Theme.

⁵⁷ see Theme 3 (ICT) and Theme 5 (Energy)

V.2.1 "Energy-efficient Buildings (EeB)" - Topics covered by the NMP Theme

EeB.NMP.2013-1 Nanotechnology for multifunctional lightweight construction materials and components

Technical content/scope: Nanotechnologies represent a promising opportunity for the energy-efficient transformation of the current building stock and the energy efficiency of new buildings. Although main efforts are given to the reduction of thermal transmittance of the envelope, there are other key functionalities which are becoming more and more relevant in retrofitting and new buildings.

With state-of-the-art products and combinations of materials, the envelope thickness during energy-efficient renovations is increasing and it gets more massive both in terms of architectural design and in terms of actual physical mass. Nanotechnology has the potential to enable multi-functionality in envelope components, fostering the development of systems which can combine functionalities like being light-weight, high thermal capacity in a defined temperature range, fire resistance in particular for steel structures, sound insulation as well as others such as Volatile Organic Compounds (VOCs) abatement, bio-protection, self-cleaning or humidity control, paving the way for industrial prefabricated new-to-build and deep-renovation packages, which can outperform on-site construction on issues as thermal-bridges and air tightness while ensuring high quality for the indoor environment. These new technologies will ultimately diminish the time required for the renovation itself while reducing the energy bill during the entire building service life. They will also address emerging health issues related with materials and ventilation such as allergies or pathologies like the sick building syndrome. On top of increased technical performance, nanotechnology enabled multifunctional light-weight solutions should increase affordability and overall return on investments.

Nanotechnology research should focus on development of new light-weight multifunctional components with high potential for energy savings, in particular for façades or roofing and for better indoor environment quality, while complying with building codes and regulations. Furthermore, potential exists to exploit nanotechnology through the development of nano-electromechanical systems (NEMS) embedded in the components and which could see whole buildings become networked with detectors and sensors to monitor energy efficiency and the quality of the indoor environment. As a result, new improved multi-functional lightweight high insulation, high reflectivity elements with low heat transfer in relation to thickness and improved mechanical properties are foreseen, providing clear benefits for the occupants in terms of high quality of the indoor environment. The new materials and their combination into components should also consider durability, easy installation, integration and aesthetics, increased indoor comfort, embodied energy, resource-efficiency, economic, health and safety aspects, environmental aspects, disassembly and reuse, etc. For safety related aspects, projects are expected to coordinate and collaborate with other relevant projects of the Nanosafety Cluster⁵⁸.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners will represent an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding Scheme: Small or medium-scale focused research projects.

Expected impact: Lightweight building components are expected for low-cost, low-energy new buildings or quick low-cost refurbishments, aiming at a factor of 2 to 4 in total (primary) energy reduction with respect to the current situation, and a cost-level equal to or better than

⁵⁸ <http://www.nanosafetycluster.eu/>

traditional (in terms of energy performance improvement) renovation activities⁵⁹.

Nanotechnology solutions will contribute to develop new components with key advantages in terms of thermal performance and reduced construction time due to 40% decrease of the dead load of the building components compared to existing solutions. It is expected that the elements will achieve at least the same fire resistance as conventional material consuming solutions while reducing the mass of the components and energy consumption⁶⁰.

EeB.NMP.2013-2 Safe, energy-efficient and affordable new eco-innovative materials for building envelopes and/or partitions to provide a healthier indoor environment

Technical content/scope: A healthier indoor environment during the service life of a building is becoming more and more critical because the implementation of energy efficiency measures leads to the construction of more tightly sealed buildings with reduced ventilation rates. Furthermore, increasingly synthetic building materials and furnishings, or natural products formulated with chemicals, biocides etc., are used.

Improved construction techniques, caulking and sealing limit the amount of air which escapes. Consequently pollutants can build up to unhealthy levels inside the buildings.

Several factors affect a healthy indoor environment. Among the most important are: release of dangerous substances, Volatile Organic Compounds (VOCs) such as formaldehyde, wood preservatives, radon, fibres, particulate matters, moisture and humidity, rotting and microbiological/mould growth, etc.

Building envelopes play an important role in controlling the amount of moisture which enters in the building or leaves it. Noise protection and comfort with regard to temperature and humidity distributions are also important factors that may be valorised to contribute to a healthy indoor environment. Comfort influences health also in the long term.

Research proposals should address the development of new eco-innovative materials for the building envelope and/or internal walls/partitions leading to healthier indoor environment. Issues on indoor environment related to the building content (interior decoration, carpets, paints and lacquers, furniture, electronic equipment, cleaning supplies etc.) or use (e.g. cleaning agents) are *not covered by this topic*. Technological solutions, such as improved ventilation and air filtration, are likewise *not covered by this topic*.

The proposed solutions should go well beyond the state of the art and primarily improve the indoor environment. The cost-effective use of nanotechnologies can contribute to solve humidity, odour and pollutant problems.

The following factors should also be considered : low embodied energy and enhanced durability for increased use duration, reduced maintenance and consequently reduced costs, respect of sustainability principles (the sustainability of each developed solution should be evaluated via life cycle assessment studies carried out according to the International Reference Life Cycle Data System - ILCD Handbook); application to both new build and renovation when relevant; ease of installation; offer of realistic solutions at a reasonable price; offer of increased comfort and noise reduction. Recycling/reuse of materials may also be addressed. Standardisation aspects can be considered particularly in relation with the work carried out in CEN/TC 350 and CEN/TC 351. Proof of concept in terms of one (or more)

⁵⁹ Nanotechnology-based lightweight solutions should be demonstrated at industrial component level in relevant environments. The innovative elements should be low-cost (LCCA) and environmental friendly (LCA), with high thermal resistance and high fire resistance in relation to thickness. The sustainability of each developed solution should be evaluated via life cycle assessment studies carried out according to the International Reference Life Cycle Data System - ILCD Handbook.

⁶⁰ Safety, fire resistance, mechanical and other features should be properly addressed, in line with building codes and regulations.

component(s) containing the new eco-innovative materials developed should be delivered within the project, excluding commercially usable prototypes (2006/C323/01), but convincingly proving scalability towards industrial needs. Information guides for applications, installation and training on the new solutions should be provided before the end of the project.

All aspects should be considered within a holistic approach to the problem and the effect of the adopted solutions should be quantified.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents a significant added value to the activities, and this will be reflected in the evaluation under the criteria 'Implementation and Impact'.

The participation of public authorities may also be an asset for the proposals, as public authorities own a large part of the building stock at European level.

Funding scheme: Large-scale integrating collaborative projects.

Expected impact: Compared to the applications and impacts of presently available materials with the same functionalities, the expected improvements are: (i) healthier indoor environment; (ii) lower embodied energy on materials (at least 15%); (iii) enhanced durability of materials (at least 20%); (iv) lower implementation costs, either in manufacturing or in application and use of the developed products (minus 20-30%, e.g. by combination of several functionalities in a single material); and (v) improved energy efficiency in buildings.

EeB.NMP.2013-3 Integration of technologies for energy-efficient solutions in the renovation of public buildings

Technical content/scope: Existing public-owned non-residential buildings represent a valuable asset in Europe. Many of them are in need of innovative retrofitting solutions, in particular those grouped in multi-building installations, since their energy efficiency is typically low. Moreover, due to the current economic crisis the investments in building retrofitting are limited. Breakthrough solutions are, therefore, needed which combine affordability along the whole life cycle with reduced energy use and maintenance effort and with increased durability, in innovative business models. These should be in line with current net zero energy standards and should allow upgrading in the future, as new targets in energy use and greenhouse gas emissions reduction emerge. The feasibility to transfer solutions from office buildings to social housing could also be considered. Technical solutions that address barriers such as cost-effectiveness, continued operation during renovation, inefficient and under-used sites, may be also considered.

Systemic approaches need to be developed which integrate the most promising technologies and materials, including for example: energy production and storage through a combination of renewable energy sources and zero-CO₂-emission micro-cogeneration at building level; energy use through innovative HVAC systems; solid state lighting; innovative fire-resistant insulation; light-weight components and made-to-measure solutions addressing the challenge of keeping, where necessary, the original aesthetics and architectural features; as well as nanotechnologies and smart materials promoting a building's reactive and adaptive behaviour following the outdoor/indoor conditions.

The district scale, since public buildings being often grouped in dedicated areas, as well as the interactions between buildings and the grid (i.e. impact on the energy demand) and with an eventual heating network should be considered. The integration of safety and security aspects should also be taken into account. The systemic approach should create economy of scale in the investment and improve return on investments. Energy efficiency should be addressed by

proper system integration and installation, e.g. through synergy between technologies which have already been proven at a small scale and need a larger scale demonstration.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. In addition, to ensure appropriateness of business models, the participation of public building owners (local, regional or national governmental organisations) is recommended.

The proposals should cover both research and demonstration activities. Whilst there is no lower or upper limit on the requested EU contribution, the target is that proposals allocate around 50% of the total eligible costs of the project (excluding management costs) to demonstration activities and this objective will be taken into account in the evaluation under the criteria S/T Excellence and Impact.

A high replication potential is necessary. At least two demonstration sites should be considered in two different climatic conditions and with different end-uses, in order to ensure that the technologies are as widely applicable as possible. The corresponding district environment should be taken into account when defining the overall approach and should be reflected in the selection of the demonstrators.

Funding scheme: DEMO-targeted collaborative projects.

Expected impact: The innovative retrofitting solutions should be proven in the demonstration buildings as real cases. They should result in a reduction of at least 50% in energy consumption compared to the values before renovation while ensuring affordability. Therefore, associated investment costs are expected to represent a maximum of 20% of the total costs of building an equivalent new building in the same location. The replicability potential should be demonstrated and the return on investment should be around 7 years (in the case of deep retrofitting). Creation of a new generation of skilled workers and SME contractors in the construction sector, conscious of a systemic approach towards energy efficiency.

EeB.NMP.2013-4 Integrated control systems and methodologies to monitor and improve building energy performance

Technical content/scope: The monitoring of real energy use in energy-efficient buildings frequently shows major differences with respect to the predicted performance. Building energy performance simulation (BEPS) models, which have proven to be very useful to compare buildings design alternatives, have difficulties to capture the real complexities of the actual building energy performance. For instance, they do not properly consider deviations due to building fabric performance, malfunction of energy and comfort systems, differences in user behaviour and variations in climate conditions. With today's high energy prices, a monitoring of the building energy consumption, together with a good assessment on the best strategy to reduce it, is crucial in terms of savings and comfort. In addition, effective methodologies for the correct understanding of user behaviour need to be developed in the context of building energy performance.

The research focus is on developing methodologies and tools to monitor and assess real building energy performance, including user behaviour, energy systems performance and climate conditions. The new methods and tools could include energy performance diagnostics for predictive maintenance (related to different construction typologies and their thermal behaviour), and should be accurate enough to support decision making during the different stages in the life of the buildings. The effective monitoring and management of energy flows to help reduce energy consumption should be addressed. There is also a need to help standardising the measurement and characterisation of building energy performance,

exploiting the latest advances in predictive analysis and modelling of thermal transfer based on multi-variable techniques and image recognition.

A holistic approach to building control and monitoring systems is required, by implementing dynamic full scale methods which accurately characterise building behaviour. High quality and reliable data acquisition methodologies are also needed. Projects should, wherever possible, address the integration of autonomous wireless sensors and sensor networks for data delivery together with smart equipment, and should also demonstrate a reduction of the typical assessment time.

If it provides added value, projects could use the developed tools and methodologies prior to a deep retrofitting, to analyse in-use building energy performance and to determine the best retrofit opportunities, as well as to calculate the savings from potential building retrofits.

Cost-effective solutions should be demonstrated in at least two different types of buildings preferentially located in regions with clearly different climate conditions and for which user behaviours are expected to differ.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding scheme: Large-scale integrating collaborative projects.

Expected impact: Significant reduction in the difference between real and predicted energy behaviour in a building, after the demonstration of the viability of the new tools and methods for measuring and analysing real building energy performance. Reduction of the typical assessment time.

EeB.NMP.2013-5 Optimised design methodologies for energy-efficient buildings integrated in the neighbourhood energy systems

Technical content/scope: The development of sustainable solutions for energy-efficient buildings properly integrated in their neighbourhood and their corresponding construction processes requires major innovations in the design tools, construction methods and management practices.

Latest advances in modelling and optimisation techniques should enable improvements in buildings design and control in order to facilitate decision-making before the construction stage. To improve the reliability of modelling tools for the construction sector, the main challenge is to ensure their interoperability and connectivity with other information systems used during the building life-cycle. Knowledge in the fields of modelling and computation should be applied to ensure the interoperability between tools from various domains and different scales in order to propose solutions adapted to collaborative multi-disciplinary work. The use of standards (e.g. ISO IFC, City GML) should be promoted, fostering interoperability.

Research activities should be focused on design at the building scale (including components and buildings systems), taking into account the adjacent systems such as district heating/cooling and decentralised thermal energy generation and other interactions with the neighbourhood. Projects should promote and set up an integrated approach in support of innovation, by providing actors with holistic methods and tools to support the optimised design of integrated energy-efficient buildings. The design phases for new buildings will be considered as priority as well as the design phases linked to retrofitting of existing buildings taking into account subsequent operation and maintenance. Knowledge based design can also be used to provide input into management systems. The Building Information Models concept and other advanced virtual approaches may also be used, including dynamic data

integration. Projects should also cover validation actions on a technical level, which apply the tools on real construction projects; and on a societal level, i.e. validation with the occupants of the building. For the latter, involvement of organisations within an Integrated Project Delivery Approach, supporting a participatory design approach, could be an asset.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding scheme: Large-scale integrating collaborative projects.

Expected impact: Optimised design of integrated energy-efficient buildings, considering the different physical dimensions in a coupled and comprehensive overall way (energy, comfort, air quality, acoustics etc.), enabling actors to take validated and quantified choices as early as possible in the design/construction/operation processes on the basis of quantified performance objectives with compliance with regulation and user-oriented comfort expectations and constraints. Proper management of interactions between different building design domains. Continuity of information flows during the life of a building from design to maintenance.

EeB.NMP.2013-6 Achieving high efficiency by deep retrofitting in the case of commercial buildings

Technical content/scope: Advanced retrofitting of existing commercial buildings, such as shopping malls and multi-functional centres, or of buildings redesigned for retailing use, requires innovative approaches in order to meet targets for reduced energy use and greenhouse gas emissions. New systemic retrofitting methodologies should be developed for buildings that have redesigned functions (e.g. an industrial warehouse being changed into a shopping or leisure centre). Such methodologies could integrate smart energy management systems and local energy generation/storage solutions that fully exploit renewable energy sources. Equipment adapted to be operated in such redesigned buildings is also needed, including for instance photovoltaic panels, panel heating and cooling, heat pumps, smart grids, flexible energy storage systems (compact and seasonal solutions) as well as smart lighting systems combining natural and artificial light. Cost effective solutions integrating emerging technologies are needed, to achieve innovative industrialised solutions and products, adaptable to the final conditions of the building (size, complex shapes, finishing, etc.) and with lower implementation time and shorter interruption of the activity of the building. Solutions that enable intensification of commercial buildings operation by solving systemic inefficiencies (e.g. unutilised roofs, inaccessible site areas) may also be considered.

The redesigned indoor environments should optimise comfort and health conditions and, therefore, integrate new functionalities and solutions, such as: self-cleaning and de-polluting materials and coatings; insulating materials with integrated air ducts for central heat recovery systems; innovative acoustic solutions; cool roofs and pavements; and smart integration of vegetation in order to avoid the heat island effect.

Health, safety and security issues as well as architectural aspects and aesthetics should also be considered. Return on investment calculations based on reliable methodologies and benchmarks are needed, within a holistic perspective including the base investment, maintenance costs and energy savings. The replication potential of the systemic approach proposed should be reflected in guidelines applicable for different buildings typologies throughout Europe.

The research activities should focus on the systemic solutions for retrofitting existing commercial buildings or those redesigned for retailing use, as well as the required adaptation of equipment and material. The deliverables can, for instance, include configuration design tools, intelligent E-catalogues, logistics scenarios, templates and guidelines. Clear evidence of

technical and economic viability should be provided by demonstrating the developed solutions in a real retrofitting project.

Synergies within the energy policy framework should be promoted.

Appropriate industrial standards as well as databases on buildings stock and retrofitting technologies should be taken into account.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding scheme: Large-scale integrating collaborative projects.

Expected impact: Significant improvement in primary energy demand is expected, reducing it from over 300 kWh/m² to less than 80 kWh/m² per year as an average. Subsequent reduction of greenhouse gas emissions, considering that in Europe 80% of the 2030 building stock already exists today. Increased share of renewable energy sources at least by 50% compared to the state of the art. The return on investment should be below 7 years. Creation of a new generation of skilled workers and SME contractors in the construction sector, conscious of a systemic approach towards energy efficiency.

V.2.2 "Energy-efficient Buildings (EeB)" - Topics covered by the Environment Theme

EeB.ENV.2013.6.3-4 Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts

This topic is a contribution to the 'Energy efficient Buildings' (EeB) Public Private Partnership. The objective is to develop improved, easy to use tools that support cost-effective decision making through design, planning and implementation of renewal/retrofitting projects (including decisions such as demolishing vs retrofitting). These tools should particularly focus on the energy performance of buildings, the impact of district space planning and connections with networks and related installations (transport, energy, water, waste). The tools should also ensure the adoption of the most cost-optimal and affordable solutions for adapting, renewing and retrofitting groups of existing buildings that may include historic structures, fully incorporating the latest innovations and best available technologies that deliver significant energy efficiency improvements while addressing multiple resource challenges and ecosystem-based approaches, such as, for example, green roofs and walls. These solutions may cover indoor and outdoor issues, as well as social and economic concerns. Sufficient emphasis should be given to the demonstration and verification of the tools to be developed and their ability to evaluate in detail the impact potential of the solutions considered along the entire life cycle from design to decommissioning and recycling. Quantification of improvements in resource efficiency, improved health and comfort and lower greenhouse gas emissions is expected, both at the micro (projects) and macro (economy) scale, taking into account the rebound effect. Economic impacts including cost-benefit analysis and investment amortisation should also be considered, using renovation projects as case studies. Projects should specifically involve developers and public authorities whilst fostering the integration of the overall value chain involving architects, constructors, operators, financing entities, users, etc. SMEs should also be actively involved. The tools to be developed should take advantage of the use of standardised or pre-standardised metrics for sustainable buildings, including those being developed in on-going EU funded projects such as 'OpenHouse' and 'Superbuildings'.

Funding scheme: Collaborative Project

The requested EU contribution per project shall not exceed EUR 3 000 000.

One or more proposals can be selected.

Expected impact: Demonstrably improved resource efficiency of existing buildings and clear reduction in energy use, in particular, together with associated CO₂ emissions. Benefits to stakeholders across the entire value chain including SMEs, leveraging the latest innovations that incorporate technologies from a wide variety of disciplines (e.g. architecture, civil and environmental engineering, energy technologies, restoration and conservation technologies, computer science, social sciences, to name just a few). Guidance to local community development agencies, developers, SMEs as suppliers and users of technologies, etc. Civil society organisations are welcome when appropriate. Support for the implementation of the Directive on the Energy performance of buildings⁶¹ and the Roadmap to a Resource-Efficient Europe⁶². Contribution to the aims of the Commission's initiative on 'Smart Cities and Communities'⁶³.

Additional eligibility criteria: Projects will only be selected for funding on the condition that the estimated EU contribution going to SMEs is 15 % or more of the total estimated EU

⁶¹ Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings, OJ L 153, 18.6.2010, p. 13.

⁶² See footnote 3.

⁶³ http://ec.europa.eu/energy/technology/initiatives/smart_cities_en.htm; see FP7-SMARTCITIES-2013 and also topics FP7.ENERGY.2013.8.8.1 and FP7-ICT-2013.6.4 under the coordinated call on Smart Cities and Communities between Themes 3 (ICT) and 5 (Energy).

contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

V.2.3 Contributions to objectives of "Energy-efficient Buildings (EeB)" by call on Smart Cities and Communities

The following topics from the coordinated call on Smart Cities and Communities between the Energy and ICT Themes will contribute to the objectives of the EeB Public-Private Partnership Initiative.

Area Energy.8.8: Smart Cities and Communities

Urban communities often share residential, public or commercial spaces that lend themselves to the early adoption of innovative technologies that can dramatically **reduce energy consumption**. Smart cities and communities are planning and acting for a more sustainable future characterised by investments in innovative, integrated technologies and services such as heating, mobility, lighting, broadband communications and other utilities. They are developing and implementing, at district or corridor level or larger, intelligent solutions, enabled by ICT and the mobilisation of their social, industrial and environmental capital, that will empower citizens and coordinate the delivery of more efficient, integrated and enhanced energy and transport services for their inhabitants.

In this context, the Commission wishes to support a greater level of integration of topics that relate to Smart Cities and Communities in the energy, transport and ICT areas. Thus, projects – which are few in number and large in scale - supported under this area will have a high level of ambition in terms of integrated technology demonstration. It is envisaged that this approach will be continued and extended in future calls, providing a coherent set of activities from technology development to demonstration and ultimately laying the foundations for commercial roll-out via horizontal actions and market measures. This area of the Work Programme therefore encompasses energy-related topics such as energy efficiency, energy (electricity, heating and cooling) networks, and renewable energy production and urban planning. Innovative solutions are sought at the interfaces of these challenges as well as with other urban issues in the areas of ICT and transport.

Cross-sector Industry consortia are invited to take the lead in close collaboration with cities to devise innovative measures that accelerate the deployment of low carbon technologies. In each project, the cross-sector industry consortium drawn from three Member States and/or Associated Countries is expected to team up with ideally one or two cities to enhance the replication potential of the measures, to ensure their EU-wide impact and to facilitate the exchange of knowledge. Financial support will be given to measures that would help cities to substantially reduce greenhouse gas emissions in an innovative and integrative manner and represent a high replication potential.

Projects supported under this area will contribute to the Energy-efficient Buildings Public-Private-Partnership and are part of the Smart Cities and Communities coordinated call between the Energy and ICT Themes (FP7-SMARTCITIES-2013). For example, the topic under this area is complementary to the topic "Optimising Energy Systems in Smart Cities of ICT theme" in which the focus is on demonstrating the integration of renewable energy sources into electricity grids (including through the use of power electronics) and optimisation of heating and cooling systems for high performance energy efficient buildings.

1.1.1.1 Topic ENERGY.2013.8.8.1: Demonstration of optimised energy systems for high performance-energy districts

Open in call: FP7-SMARTCITIES-2013

Contents/scope: The objective of this topic is to demonstrate, at the level of cities or districts, an innovative integrated energy system, optimised both in terms of increase in energy efficiency and CO₂ reduction.

This objective may be achieved with a balance of supply-side measures based on a high share of renewables and demand-side measures to reduce consumption. Although the balance shall be optimised for each city, it should lead to a good business case for replication.

The proposals should address all of the following three aspects through a credible and coherent integrated approach.

1. **Retrofitting of a district towards zero energy buildings.** The proposed measures should aim to demonstrate innovative technical, economic and financial solutions which significantly increase overall energy efficiency. All types of buildings can be addressed, with a focus on residential buildings. All elements and systems of the buildings that could in a life-cycle perspective (thus including embedded energy) contribute to a better energy efficiency and sustainability through integrated design and planning should be envisaged, the measures shall be chosen based on a sound assessment of the social, economic and environmental performances of the different technology options. The detailed metering/monitoring programme should last at least for one full year, however, longer term commitment and programmes of the building operators (e.g. in continuous monitoring and/or guarantees of performance to the tenants) would give an added value to the proposal. The monitoring programme should include behavioural aspects (see additional information on the next page).
2. **Proposing innovative solutions for the medium and low voltage electricity distribution grid,** with the objective to improve the integration of a large share of power generated from renewable energy sources (for example photovoltaic installations) with the power supplied a conventional centralised installation (for example a Combined Heat and Power plant), and to increase energy efficiency of the distribution grid by implementing smart solutions and new efficient network components. In case of photovoltaic installations, the integration in the built environment of standardised PV building components requires both electric and architectural optimization, combining electricity production with substantial ICT part. Proposals should also consider electricity storage devices and strategies to better match supply with demand, optimise district and single building storage approaches, and provide ancillary services for the grid quality. In addition, proposals can cover technological and economic assessment of the integration of electric vehicles into the local grid, with intelligent charging/discharging systems and assessment of the best balance of stationary versus mobile storage.
3. **Proposing innovative solutions for district heating and cooling energy supply,** with the objective of improving the overall efficiency of the system (heat generation, distribution and final use). The applicants should propose district heating and/or cooling systems based primarily on recovering waste heat and adapting the temperature levels of the grid to the applications. Additional energy sources might include a significant share of local renewable energy sources supply. In doing so, the proposals could envisage links with industrial parks. The proposals should consider innovative applications for hot water, such as white goods supply. It should also make the best use of heat or cold storage devices or systems. Both short term and long term storage systems can be envisaged.

The activities proposed by the applicants should be based on a convincing city and mobility planning exercise with special consideration of innovative energy technology integration and participation of all relevant actors, completed at an earlier stage. Costs related to this planning exercise are not in the scope of this topic. All proposals should present a sound business model of all measures envisaged to be carried out in the project. This model should pay particular attention to assess economics and benefits for industry and the customers and end-users. The proposals will be asked to report performance data into existing horizontal activities for good-practice sharing, such as CONCERTO and the Smart Cities Stakeholder

Platform. Thus, they should allocate appropriate resources for comprehensive reporting and innovative dissemination measures.

Expected Impact: In addition to the impacts outlined for this Area in general, successful projects should set-up clusters of cities, and partnerships between cities and industries. Through integrated actions, projects should demonstrate their viability as new innovative market solutions and show a high replication potential for large-scale market deployment before 2020. An ambitious dissemination and market deployment plan should be included in the proposal. The credibility of this plan will form part of the evaluation.

Funding scheme: Collaborative Project with a predominant demonstration component

Additional eligibility criterion: The maximum requested EU contribution per project must not exceed EUR 30 million.

Additional information: The grant will always be composed of a combination of: the typical reimbursement of eligible costs, and flat rate financing determined on the basis of scale of unit costs only for the building-related demonstration activities part of the buildings.

This action supports the implementation of the Smart Cities and Communities Initiative of the SET-Plan. The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

It is envisaged that three to five projects could be funded.

Additional information concerning aspects 1, "Retrofitting of a district towards zero energy buildings":

The scale of unit cost for European Union financial contribution is fixed at EUR 100 /m² eligible costs and thus EUR 50 /m² European Union contribution. The amounts determined on the basis of the scale of unit costs are reimbursed by applying the upper funding limits specified in Article II.16 of the model grant agreement. Therefore, the reimbursement rate will be up to 50%, i.e. EUR 50/m². The eligible costs per m² for the building demonstrated in the project(s) are fixed costs. The total of European Union financial contribution based on scale of unit costs may not exceed EUR 15 million per project. The evaluation of the proposals will also take into account under the "S&T excellence" criterion the degree of excellence and innovation of the technology used, the level of projects ambition and the most cost effectiveness of the practices to be demonstrated, given the local context (euros/efficiency gain; euros/CO₂ reduction, kWh/m²/year saved). For this reason, the above figures should be indicated in the proposal. It is strongly suggested for participants to complete and include in the proposals the Building Energy Specification Table (BEST) summarizing this information for every type of building proposed. The template of the BEST table is made available through the relevant Guide for Applicants.

Objective ICT-2013.6.4 Optimising Energy Systems in Smart Cities

Cities are increasingly recognized for their ability to play a catalytic role in addressing climate and energy challenges using technologically innovative approaches. This can be achieved by creating new partnerships connecting city leaders and stakeholders to secure practical commitments for implementing green digital agendas.

Projects supported under this objective shall contribute to the Energy-Efficient Buildings Public-Private-Partnership launched in 2008 as part of the European Economic Recovery Plan. This objective is part of the Smart Cities initiative between Theme 5 (Energy) and Theme 7 (Transport). In particular it is complementary to the topic "Demonstration of Optimised electricity and heating/cooling systems". Here the focus is on software systems for new business models and user engagement whereas in Theme 5 the focus is the physical integration (including power electronics devices).

Target Outcomes

a) Decision-support systems and/or management and control systems for energy-efficient neighbourhoods. These systems shall consider de-centralised renewable energy production, connection with the smart electricity grid and integration with smart district heating and cooling grids through CHP (Combined Heat and Power) and other renewable energy sources. They shall optimise the use of energy in city areas with different types of demand to enable local balancing, demand response services, variable tariffs and easy change of supplier.

In addition to technical work proposals shall consider appropriate service business models, privacy and trustworthiness and shall involve users throughout all phases of the project. They are to be considered not only as observed subjects but also as a source of innovation. Systems should be built considering openness and interoperability up front. Both behavioural sciences and economics are to be core activities.

Proposals should cover (i) technical developments, mainly adaptation and integration of existing ICT, (ii) a substantial validation phase in real-life environments in at least two cities and (iii) a precise evaluation phase where proposals shall record evidence of energy savings, total cost of operation, scalability of the solutions, user's acceptance, benefits that accrue, and extract lessons for those planning to deploy and finance such systems.

Considerable resources are expected to be committed, however consortia must be compact with partners each making substantial contributions.

b) Coordination and Support Actions: Bringing together relevant stakeholders including process engineering specialists, ICT software and equipment providers, RES providers, energy companies (including ESCOs - Energy Service Companies), building and construction sector companies, as well as local and regional authorities, to:

- Take over the work done by ICT4E2B Forum and IREEN and extend their roadmaps from buildings and neighbourhoods to smart cities and extended urban/rural communities in a holistic dimension;
- Analyse the relationship between producers, distribution companies and consumers of energy in particular new business models and opportunities for SMEs. Identify best practices and opportunities for knowledge transfer.
- Identify ICT/Energy vocabularies and ontologies to foster interoperability of Energy Management Systems related to the building and construction domain, and beyond the building into public spaces, neighbourhoods and districts, and analyse their relevance and possible evolution towards formal standards; analyse their potential extension to energy

management in industry and commerce. Work has to build on the results of the previous Workshops on Energy Efficiency Vocabularies⁶⁴.

- Assess possibilities for making publicly available data obtained from validation activities; work proactively together with project consortia towards this end and assess relevant legal requirements around data protection.
- Support the establishment of European-scale actions spanning research, innovation, standards-setting and deployment in Smart Cities

The tasks shall include drafting and up-dating public documents, organising expert hearings and workshops, dissemination and networking events.

Expected Impact

- Quantifiable and significant reduction of energy consumption and CO2 emissions achieved through ICT.
- Adoption of ICT by city authorities;
- Number of publications jointly authored by researchers from ICT, energy, construction and civil engineering and city experts.

Funding schemes

a) STREP; b) CSA

⁶⁴ http://ec.europa.eu/information_society/activities/sustainable_growth/buildings/index_en.htm

V.3 ‘European Green Cars’ Public-Private Partnership (GC) - Cross-thematic cooperation between NMP, ICT and Transport (including Aeronautics)

The automotive industry is one of Europe’s key industrial sectors, whose importance is largely derived from its linkages within the domestic and international economy and its complex value chain. It is estimated to account for close to 8% of total manufacturing value added (ca. EUR 120 billion, 2006) and about 6% of total manufacturing employment (over 2 million employees). The automotive industry also provides an indirect employment to 10-11 million persons and is one of the largest RTD investors in the EU with over EUR 20 billion annually (ca. 5% of its turnover)⁶⁵.

The foreseeable shortage in crude oil based energy carriers is driving fears about energy security: 73% of all oil consumed in Europe is used in transport and estimates predict a doubling of passenger cars within the next 20 years. From an environmental and energy point of view there is an urgent need to find alternatives to fossil fuels in order to secure future energy supply, to guarantee the availability of appropriate material recycling technologies, and to reduce greenhouse gas emissions and other potential environmental impacts related to the automotive industry entire life-cycle. It is thus increasingly evident that a particular emphasis should be put on the rapid development of technologies supporting the massive emergence of more efficient and sustainable road transport solutions based on alternative fuels/energy, and on the RTD efforts associated with them.

The ‘*European Green Cars*’ PPP Initiative is a series of measures boosting research and innovation aiming at facilitating the deployment of a new generation of passenger cars, trucks and buses that will spare our environment and lives and ensure jobs, economic activity and competitive advantage to car industries in the global market. A series of different measures are proposed: support to research and innovation through FP7 funding schemes, specific EIB loans to the automotive and other transport industries and its suppliers, in particular for innovative clean road transport, and a series of legislative measures to promote the greening of road transport (circulation and registration taxes, scrapping of old cars, procurement rules, the CARS21 initiative).

Other actions that are very closely related to the ‘European Green Cars’ Initiative but not formally included in it are being implemented, such as the ‘Fuel Cell and Hydrogen’ (FCH) Joint Technology Initiative and the road transport projects funded under the FP7 Transport Theme.

The ‘European Green Cars’ Initiative includes three major research and development avenues within its RTD pillar:

- **Research for heavy duty vehicles based on internal combustion engines (ICE)** (Sustainable Surface Transport (SST) sub-theme): The research will primarily concentrate on advanced ICE with emphasis on new combustion, the use of alternative fuels (e.g. bio-methane), intelligent control systems, ‘mild’ hybridisation (use of recuperated electricity to power the auxiliary systems) and special tyres for low rolling resistance.
- **Research on electric and hybrid vehicles:** This component will be the most essential in this package. To have a real impact on the green economy, research in this field should no longer focus on electric vehicle technologies seen in isolation from the rest of the transport system: a massive introduction of the technology requires the availability of smart electricity grids and intelligent vehicle charging systems tailored to customers' needs.

⁶⁵ ‘European industry – a sectoral overview’, 2006 update, EC DG ENTR

- **Logistics and co-modality** combined with **intelligent transport system** technologies are essential to optimise the overall system efficiency and sustainability avoiding for example that empty trucks circulate on highways due to sub-optimal logistics. In this respect, smooth and co-operative interactions between the different transport modes will be essential.

The 2013 work programme includes three groups of topics:

- Materials for batteries, implemented through the NMP Theme.
- Development of electric vehicles for road transport and on-road charging, research for heavy duty vehicles for medium and long distance road transport, and logistics and co-modality, implemented through the Sustainable Surface Transport (SST) sub-theme of the Transport Theme.
- Architectures for electronics in the car; and comprehensive energy management systems for its infrastructure integration, implemented through the ICT Theme.

The indicative budget for 'Green Cars (GC)' is EUR 112.45 million in 2013, of which EUR 20 million is from the NMP Theme⁶⁶, EUR 40 million from the ICT Theme⁶⁷ and EUR 52.45 million from the Transport Theme⁶⁸.

The Transport topics of the GC initiative also support the Smart Cities Scheme, whose main call is FP7-SMARTCITIES-2013.⁶⁹

In addition, the topics ENERGY.2013.7.3.1 and ENERGY.2013.7.3.2 under the coordinated call on Smart Cities and Communities between the Energy and ICT Themes will contribute to the objectives of the GC Public-Private Partnership Initiative.

⁶⁶ call FP7-2013-GC-MATERIALS

⁶⁷ call FP7-2013-ICT-GC

⁶⁸ part of call FP7-SST-2013-RTD-1 and call FP7-TRANSPORT-2013-MOVE-1

⁶⁹ see Theme 3 (ICT) and Theme 5 (Energy)

V.3.1 "European Green Cars" (GC) – Topics implemented by the NMP Theme

GC.NMP.2013-1 Improved materials for innovative ageing resistant batteries

Technical content/scope: Electric cars in the form of Battery Electric Vehicles (BEV) or Hybrid Electric Vehicles (HEV) are a key technology for reaching a cleaner and more sustainable society and its development is considered in actual Commission Policies, in particular in the PPP on Green Cars. However, a lot of challenges still have to be faced before being able to introduce electric vehicles that could perform as well as combustion engine powered vehicles, and a main issue is related to battery technology. A main challenge in this respect is to produce batteries that may provide e.g. sufficient power density, energy density and rechargeability while having a low weight and that may be quickly charged or re-charged, yet maintaining the safety that is necessary for the use in electrical vehicles. Furthermore battery production and usage should be sustainable, thereby considering a complete Life Cycle Assessment of the used solution. And finally the production and running cost and battery lifetime are other key factors. A way forward to reach this goal is looking towards new and improved battery materials. In the last years the research on battery materials technology was boosted worldwide, and huge investments were made in the development of new battery materials, going beyond the nickel based and improving the current lithium-ion technology. In order to maintain competitiveness, battery and battery cell and system production technology should be improved in Europe. The Commission reflected this in three consecutive calls related to the PPP on Green Cars, and started activities with the work programme of 2010 fostering the improvement of currently available lithium batteries, passing to its production techniques (WP 2011), and looking towards the next generation of post lithium-ion-technology (WP 2012). Some progress could be made in the last years with respect to energy density and power density, but a main problem that has not been considered thoroughly is the charging modality during practical use. Batteries may be charged slowly, overnight, or quickly in 30 minutes. New electrical grid technologies foresee also bi-directional charging/discharging as well as continuous charging. The depth of discharge (DOD) level thus may vary significantly at every single discharging cycle. Due to this usage, charging behaviour and materials lifetime are strongly affected. In practice the effects lead to a shorter battery lifetime, as after certain charging cycles only a much reduced charging capacity and respective battery power and performance remains. However, the full life-time performance of novel electrical vehicle battery cells and systems, including those based on the current Li-Ion technology, has not thoroughly been studied so far.

Research proposals should focus on the investigation of ageing mechanisms in battery materials, including the current lithium-ion technology, in order to understand the basic physical and chemical phenomena and processes that lead to the deterioration of battery performance (at cell and system level) over time. The active materials should be considered to be already suited for automotive EV/HEV applications.

Improvements in cell chemistry (liquid or solid electrolytes, separators, additives, non electrochemically active materials, surface treatments, innovative architectures in electrode micro or nanostructure) and system (SOC strategy, thermal management) should be developed to improve the minimum residual charging capacity after a suitable amount of charging cycles. Today a life time of 10-15 years and recharging number of 1200 cycles at 80% DOD is envisaged; ideally 3000-5000 charging cycles after 10-15 years of use should be reached (new promising high energy density battery materials actually permit only about 10 charging cycles, depending on the battery technology). The performance of the newly developed aging resistant cells and systems should at least equal the energy density and power density that are reachable with existing materials, taking into account the variety of user profiles and its translation in current regimes, average DOD, external temperature variation

and the like. The development of new chemistries and technologies to overcome the aging mechanism should take into account the various types of charging that occur during the lifetime of the battery, overnight charging, fast charging, recharging, grid charging and grid de-charging, charging in different climatic conditions (-20 to +50°C, for instance). In particular the effects of fast charging/discharging and deep discharging that are related to huge temperature gradients should be considered, also with respect to safety issues. The performance, lifetime and reliability of the advanced cells and battery systems should be assessed and tested under typical operational and extreme conditions with respect to durability and intrinsic safety, as well as environmental health and safety and external mechanical, electrical and climatic stress, e.g. safety after short circuit, fire and car accident/crash. Proof of concept in terms of product and/or process should be delivered within the project, excluding commercially usable prototypes (2006/C323/01), but convincingly proving scalability towards industrial needs, while maintaining the safety and the stability of the technology. Test methods and simulation tools that enable a thorough modelling and understanding of the aging and degradation processes at both cell and system levels are of great importance. Dedicated modelling can be developed to allow predicting the lifetime, reliability and residual value of the new electric vehicle battery and the results should be backed up with strong evidence provided by "post-mortem" analysis. A related testing procedure applicable at European level should be developed.

In addition to the above, the following issues have to be taken into account:

- Considering the intensive research efforts occurring in the field so far, and the dynamics of development of new knowledge, it should be thoroughly demonstrated that new developed materials and technologies permit a considerable increase with respect to the state-of-the-art. This should be underpinned by an extensive study and presentation of the existing knowledge at the date of proposals submission;
- The new technologies should permit a sustainable maintenance of the battery at cell and/or system level;
- Standardization and regulatory issues should be addressed;
- The effect of battery materials and cell production processes on the environment should be minimised,
- An appropriate Life-Cycle Analysis of the advanced materials and the respective components and systems, including dismantling and recycling technologies should be carried out;
- The life-cycle cost of the materials and assemblies as well of the production technologies should be considered by carrying out an economic analysis, including material resources availability. A thorough cost analysis should demonstrate the real advantages of the new materials, cells and systems;
- IPR issues and the use of background and foreground should be intensively discussed and the arrangements in the consortium should allow suitable access of the knowledge to all participants of the consortium, while safeguarding industrial competitiveness through adequate measures (i.e. through patents, licenses or other agreements)

Funding Scheme: Large-scale integrating collaborative projects.

Expected impact: (i) Understanding and verification of ageing and degradation processes in electrical vehicle batteries; and (ii) Considerable improvement of the battery lifetime while maintaining optimal battery performance: it should be demonstrated that the new materials used in the cells and systems would allow recharging, at system level, of a minimum of 4000 cycles at 80% DOD in typical BEV conditions over 10 to 15 years, while maintaining energy densities of at least 250 Wh/kg over the lifetime and permitting a considerable reduction of the battery "memory effect"; and (iii) Economic viability and technological feasibility of the

advanced materials and the related processes with reference to real applications of industrial relevance; and/or (iv) Improvement of European battery production capacities; and/or (v) Options for the use of environmentally friendly and sustainable materials.

V.3.2 "European Green Cars" (GC) – Topics implemented by the ICT Theme

Objective GC-ICT-2013.6.7 Electro-mobility

The European Green Car Initiative (EGCI) is part of the European Economic Recovery Plan launched in November 2008 to respond to the global economic crisis. This Public-Private-Partnership (PPP) aims at demand-side measures to support the development of new and sustainable forms of road transport. The ICT contribution to this initiative aims at improving the cost- and energy-efficiency of the fully electric vehicle and its value chain through the application of advanced ICT. Objective 6.7 under ICT and relevant objectives under NMP, Environment, Energy and Transport are co-ordinated and jointly support the EGCI PPP.

This objective addresses fully electric vehicles (FEV), meaning electrically-propelled vehicles that provide significant driving range on purely battery-based power. It includes vehicles having an on-board electrical generator as range extenders. The objective also covers small light-weight passenger and duty vehicles. Projects supported under this objective should advance the research, development and integration of major building blocks for the FEV, and for its infrastructure integration.

Target outcomes:

a) Advanced System Architecture for FEV

The target is to progress FEV with new or expanded functionality of existing hard and software architectures for electronics leading to radical cost reduction, reduced complexity, increased reliability and flexibility and higher energy efficiency.

Advanced concepts for the integration of multiple functionalities into smart subsystems for energy storage, traction, and power control including e.g. bi-directional energy transfer (managed/controlled charging), energy recovery and improved road handling. Work shall address the re-design of the electric and electronic architecture; assessment of the implication for safety, security, reliability and robustness of the electric power train operation including EMC and the development of related international standards; the usage of low power consuming cooperative systems for cost efficient, real-time and safe operation of the vehicle.

Also included are technical solutions facilitating recycling and reuse of components; standardised, cost-efficient and reproducible testing concepts for vehicles and subsystems; ICT solutions for cost efficient, flexible production of small volume, customised (sub-) systems and vehicles driven by the different requirements of different customers.

b) Comprehensive Energy Management

The objective is ICT for optimising the energy system inside the FEV and the connectivity of the FEV using Comprehensive Energy Management Systems including efficient vehicle-based solutions for grid and road integration taking into account aspects of autonomous driving and integration in cooperative systems as appropriate.

Increased synergies of electric traction, autonomous driving and cooperative road-vehicle systems for energy-, cost- and time-efficiency as well as safe operation of the vehicle including autonomous positioning or guiding are targeted. Work shall address alternative, innovative ICT-based solutions for optimised recharging interfaces and methods (inductive; continuous; fast; en route) and include vehicle-based energy harvesting and the management of combinations of different energy sources and storage as well as the management and optimisation of energy storage ageing, charge monitoring and certification of energy content. Projects in this field are expected to establish cooperation and to coordinate with relevant projects under NMP, Environment, Energy and Transport to jointly support the EGCI PPP.

Also included are the assessment of related safety and health concerns regarding the use of electric vehicles; work towards common user interfaces including privacy and data security

standards for flexible subsystems and mobile devices (smart phones, tablets etc.) and the contribution to standards e.g. for dynamic and bi-directional energy exchange between the vehicles and the smart grid.

c) Coordination and support actions

Business models for the deployment of FEV in public, personal, and freight transport; pilot educational and training programmes and curricula; stimulation of the international dimension for European FEV and the global presence of SMEs; and contribution to the setting of standards are envisaged. Proposals should predominantly address SME activities.

Expected impacts:

- Improved energy efficiency and extended driving range of the FEV
- Increased performance and reduced costs of the electronic components and the overall FEV produced in Europe.
- Better integration of the FEV in the smart grids and cooperative infrastructure
- Significant improvement of FEVs' safety and comfort
- Strengthened global competitiveness of the European automobile, ICT and battery sectors; market penetration of key components of FEVs.

Funding schemes

a), b) IP, STREP: It is expected that at least one IP is selected per target outcome. Individual proposals may address both target outcomes.

c) CSA

V.3.3 "European Green Cars" (GC) – Topics covered by the Sustainable Surface Transport (SST) sub-theme of Transport Theme

These topics are included in a call of the Sustainable Surface Transport (SST) sub-theme of the Transport Theme and the corresponding call fiche can be found in the work programme of that Theme.

GC.SST.2013-1. Feasibility analysis and technological development of on-road charging for long term electric vehicle range extension

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Contents and scope: Wide-scale adoption of pure Electric Vehicles (EVs) requires advanced charging solutions which provide a user experience similar to today's cars, particularly in terms of range. In the long term, electric vehicles might be able to collect energy from the road, be it in a conductive or contactless fashion. Compared to the current paradigm of larger installed storage capacity or fast charge or switchable batteries, advanced charging solutions might improve driving range and battery lifetime of the full electric vehicle (FEV) as well as its energy efficiency and price, given the need for a smaller battery.

Research will address the following aspects at the system level:

- Analysis of the feasibility of the possible technological options of on-road charging (including transferring solutions currently proposed for stationary or rail mobile applications to light duty vehicles and possible extension to buses and medium trucks for urban applications) and their testing and comparison in terms of the main parameters such as cost, transferable power and efficiency, and infrastructure requirements.
- The impact on the vehicle in terms of architecture and capacity of the on-board energy storage systems should be assessed.
- The ergonomics of driving while in charging mode and potential links with (semi) automated driving benefiting from the presence of the charging line; the potential of related technologies like platooning should be explored.
- Development and technological demonstration of one selected charging option in terms of the required on-board and on-infrastructure energy transfer technology, maximizing efficiency and instantaneous energy transfer rates.
- A comprehensive assessment of impacts of the selected on-road charging option related to:
 - Economics (capital and operating cost impacts on the vehicle and on the infrastructure) including business cases for the gradual introduction in urban and extra-urban roads
 - The distribution network and the electricity generation. High power connections will be required for on road charging and some of the power use may be shifted to peak hours. The assessment should include opportunities for renewable energy use in different stages of deployment.
 - Assessment of pavement construction and maintenance requirements, including interaction with other technological infrastructure in or below it. Assessment of impacts on road infrastructure should be part of the demonstration of the charging technology.
 - Environment, including a life cycle assessment of environmental impacts, risks and benefits of the entire proposed solution for continuous charging of the vehicle, including the vehicles, the infrastructure and the energy production and distribution, comparing it with the current reference cases of slow and fast charging FEVs and range extended/plug in hybrids.
 - Safety (including EMC) and health impacts on electronic systems, vehicle occupants and on persons and animals close to the infrastructure.

- Assessment of the needed ICT solutions to support the driver and charging energy costs, including data security and privacy issues.
- Measures enabling the staged deployment of charging infrastructure and the required harmonisation and standardisation

Strong links should be established with running EU and national funded projects in the same area, particularly as far as charging technologies are concerned. Furthermore, the project is expected to establish cooperation and to coordinate with relevant projects under the NMP, Environment, ICT and Energy programme to jointly support the ‘European Green Cars Initiative’. The participation of SMEs is particularly encouraged.

The projects financed under this topic will contribute to the objectives of the Smart Cities and Communities Initiative.

Expected impact:

- A global feasibility and demonstration study of the on-road charging concept capable of orienting future activities while highlighting the relevant social, environmental and economic issues and any technological gaps.
- Provide evidence on environmental, economic and energy system benefits of advanced on-road charging options.
- Advanced steps for bridging technological gaps and bringing about a rational solution for both the grid and the road infrastructure.

GC.SST.2013-2. Next generation electric motors

Level 2 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: The energy efficiency and affordability of pure electric vehicles can be improved by next generation of electric motors. Improved materials or substitutes could deliver higher and tailored output while reducing weight and volume. The scarcity and the recyclability of such materials should also be addressed considering the mass introduction of next generation electric vehicles.

Research will focus on:

- Weight reduction and power density increase.
- Increased efficiency, including smart packaging of power electronics and integrated thermal management.
- Optimised design and processes for manufacturing and dismantling.
- Novel or substantially improved materials for permanent magnets replacing or greatly reducing rare earths content, or innovative magnet-free designs.

Expected impact:

- Increased energy efficiency over a wide range of EV operating conditions.
- Reducing cost towards mass use in next generation electric vehicles.

GC.SST.2013-3. Future light urban electric vehicles

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: The objective is to close the gap between bikes/mopeds and cars by developing light, affordable, safe, ergonomic and energy efficient electric vehicles (at least two seats and three wheels) meeting customer expectations in all weather conditions. The focus is on passenger applications (although freight delivery derivatives can be expected) and on the global vehicle architecture and design.

Research under this topic will use technologies and components which are either off-the-shelf or covered in previous calls (no specific technology development of components) to address collectively the following aspects:

- Optimised weight through innovative materials and system integration.
- Safe and integrated chassis and body shell design to achieve similar occupant safety level than in normal passenger cars despite worse conditions by using optimised crash detection mechanisms and actuators (restraints and structures); high compatibility design.
- Extremely low energy consumption with purely electrical braking providing enhanced recuperation capability with respect to the state of the art and advanced stability systems. This research should also consider the possible failure modes and give attention to any regulatory requirements for such systems.
- Assembly line capable designs based on low energy consuming manufacturing processes.
- New business approaches, based on reasonably low budgets and leading to novel supply chains

Expected impact: Vehicle prototypes will demonstrate the following performance:

- 40-80 Wh/km energy consumption in real urban driving corresponding to the given weight bracket.
- At least 150 km pure electric range in real urban driving including the use of comfort accessories.
- Compelling acceleration (0 to 100 km/h in 10 s).
- Best in class protection for the driver and passenger and for pedestrians in Euroncap crash tests, with highly compatible design.

GC.SST.2013-4. Demonstration of electric buses as urban public transport

CP - Call: FP7-TRANSPORT-2013-MOVE-1

Contents and scope: The White Paper ‘Roadmap to a single European transport area’ calls for a transition from a car based personal mobility to a public transport based mobility. Public transport plays also an important role in mitigating the negative effects of transport in urban areas such as congestion, greenhouse gases and pollutants emissions. Clean, energy efficient and silent buses will contribute to meet these objectives. A large demonstration project will facilitate the market take up of electric buses in Europe. The fleets of urban buses will include the main types of electrification technologies dealing with different scenarios of interaction with the electricity grid. The proposal time frame should be designed to take on board latest development in EU or national programs and latest available innovative industrial technologies for all vehicle categories considered. Existing local or regional demo projects and new projects could be coordinated in this demonstration project.

The activities to be carried out should include:

- Demonstration of the use of electricity as energy vector for urban buses in a wide range of real-life operating conditions. The project could demonstrate innovative electric buses with different types of electrical power train systems covering plug in hybrid to full electric technologies. Fuel cells buses should be excluded from the proposal. Focus should be on vehicles with interaction with the grids. The demonstration sites should provide various climatic and geographical conditions. Coordination of existing local, regional or national demonstration programs is an asset.
- Assessment of the infrastructure optimisation and bus-to-grid interaction scenarios.
- Development of standards, investigation of safety issues, and technology validation for performance, durability and costs.

- Assessment of the impact on energy and environment, including a well-to-wheels analysis.
- Communication, dissemination of information, and education.

The project should have a predominant demonstration component. The marginal cost associated with the innovation element compared to state-of-the-art vehicles will be considered as eligible cost. A typical consortium could include cities or regional authorities, fleet operators, vehicle and equipment manufacturers, utilities, research centres and universities.

This activity should assimilate the results of previous FP7 research projects on buses and establish links with the projects under topic SST.2012.3.2-1 'Coordinating innovation for efficient bus systems in the urban environment', topic GC-SST.2012.1-7 'Demonstration of urban freight electric vehicles for clean city logistics', and FP7 project 'Green emotion'.

The projects financed under this topic will contribute to the objectives of the Smart Cities and Communities Initiative.

Expected impact: This project should clarify the viability of the different types of electrical buses for immediate market introduction within urban areas. The expected impact of this project is an acceleration of the market roll-out of electric buses in order to meet EU policy objectives. The project should facilitate pre-commercial procurement and foster innovation in the public sector. The project should also help to clarify possible support for further deployment of electric buses in European cities through European Investment Bank instruments.

GC.SST.2013-5. Configurable and adaptable truck

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Contents and scope: Today trucks are designed and optimised towards a limited variance set of usage and for maximum payload. In the future there will be an increasing need for optimised load efficiency for each mission of a truck, and for optimising the freight carried on a finite length of road. The objective of research is to develop innovation solutions for the truck and load carrier design to have an integrated approach on configuration and adaptation of the vehicle concepts. Both the design phase (e.g. new tractor-trailer architecture) and the operation phase should be considered. A key aspect in the design phase is to have a modular drive line for rightsizing the vehicle combination with respect to the transport assignment while keeping vehicle performance (e.g. stability). In the operation phase, the vehicle combination should be adapted to the actual driving environment (i.e. traffic situation, topology, and payload). The implications of vehicle and conveying concepts for the infrastructure should also be considered. The project should also investigate legal constraints and harmonisation issues across the EU, e.g. engine certification, vehicle combination dimensions, etc. and identify possible deployment scenarios.

The following issues should be addressed by research:

- Optimised trucks design for transport mission.
- Configurable truck (tractor and trailer) and load carrier concepts.
- Energy tailored driveline, with a modular approach for rightsizing.
- Total truck – trailer architecture including modular powertrain.
- Distributed driveline including high level of hybridisation.
- Consideration of the infrastructure (pavement and bridge) needs: including methods to overcome any negative consequences from future types of trucks which may result from

different distributions of axle loading (distributed driveline) or overall weights and dimensions.

The project should include the development of a demonstrator of complete vehicle combination and requirements on modular tractor and trailer design.

Expected impact: Viable concepts for better matching and combination of truck and load carrier to different types of transport assignments together with the infrastructure construction and maintenance aspects that will lead to an improved load efficiency both from an energy (estimated to 25% less energy/t.km, drag reduction, driveline and transport mission rightsizing,) and infrastructure service usage point of view.

GC.SST.2013-6. High efficiency energy conversion for future heavy duty transport

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: The aim of research is to develop innovative complete high efficient energy conversion concepts for heavy duty trucks.

Research may include:

- innovative power converters (with a level of demonstration, and therefore funding, coherent with the level of maturity of the concept);
- engine downsizing concepts, e.g. dynamic cylinder deactivation;
- refined combined cycle systems, with e.g. heat, steam or fuel cell systems;
- drive train concepts reducing the transient environment for the engine, e.g. by dynamic energy storage offering optimisation potential of the engine; etc.

These converters must be designed to be operated in combinations with highly efficient integrated after-treatment solutions. A new generation of total driveline control architectures should be developed which utilise the potential of the new energy converter concept in an optimal combination with truck energy usage and energy recovery systems on-board.

Expected impact: Demonstration of new innovative energy conversion concepts which reach a system efficiency well above 50% at acceptable costs with the capability of achieving Euro VI emission levels in real life by PEMS⁷⁰ measurements with a 1.2 multiplier.

GC.SST.2013-7. Technical and operational connectivity in intermodal freight transport

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: Ports, freight terminals and the transport industry are confronted with

- ever increasing volumes to handle (continuous volume growth over the years as well as increased vessel sizes);
- new logistic concepts applied by shippers such as co-modality and synchro-modality, the latter offering companies the ability to time and again select the most appropriate mode of transport for a particular moment and circumstances;
- the need for innovative transshipment technologies allowing cost efficient integration of small and voluminous container flows and the sharing of transport volumes which may e.g. require stop and go operations in addition to point to point shuttle services;

⁷⁰ Portable Emissions Measurement Systems

- the fast growing development of e-freight applications and networks for a secure, reliable and efficient platform for digital information exchange for global trade and logistics; and
- the growing development of port - hinterland networks.

The objective of this topic is to increase the individual and co-operative performance quality and throughput of ports and terminals through the development of innovative technologies, infrastructures and e-freight solutions. Research under this topic will address the following aspects:

- Next generation of environmental friendly safe and efficient “Automated Guided Vehicles” for the transport of goods within ports/terminals or beyond fenced spaces, i.e. between ports/terminals, and supportive infrastructure.
- New transshipment technologies, new management and software tools, including information systems to improve visibility and access to data in order to promote the generation and use of multimodal routes for goods transport.
- Low-cost innovative connectivity solutions based on existing, freely available components, which may include upload and download facilities, document sharing facilities with access authorisation mechanisms, electronic document readers, a basic data model that is in line with existing international standards, and dashboard functionality. Functional requirements and main components for modular connectivity solutions in international trade should be addressed.

Cooperation with Mediterranean partner countries is encouraged.

Expected impact:

- Efficient and safe port and terminal operations.
- Efficient, safe low environment impact use of transport means within and between ports and terminals.
- Contribution to the open up of e-freight developments to a wider community, notably SMEs and link them up with networks that are being developed predominantly by big companies.
- Development of easy to use and affordable software solutions and demonstrate connectivity solutions (in particular for SMEs in the transport sector) in different trade lanes, within the European Union, and between European Union and third countries, for different purposes, with special attention for the ease of use, low entry barrier, possibilities for quick connect and disconnect, and possible business models.

Assessment of the benefit for international trade of a general roll out of this type of connectivity solution.

V.3.4 "European Green Cars" (GC) – Topics covered by the Energy Theme

The following topics from the coordinated call on Smart Cities and Communities between the Energy and ICT Themes will contribute to the objectives of the GC Public-Private Partnership Initiative.

Topic ENERGY.2013.7.3.1: Planning rules for linking electric vehicles (EV) to distributed energy resources

Open in call: FP7-SMARTCITIES-2013

Contents/scope: The aim is to develop network planning rules and tools to enable electric vehicles in a large scale roll out and to maximise their potential for linking with and balancing of distributed energy resources. The project should provide methods to deal with specific infrastructure characteristics, and local load and congestion issues. Furthermore, it should propose cost effective solutions and investment strategies. The work should take due account of the particular load characteristics and the level of intelligence for a broad range of charging scenarios for electric vehicles. The project should relate to network planning activities from a representative set of distribution networks in Europe and include competence on Low Voltage / Medium Voltage grid simulation and support from automotive manufacturers.

Funding scheme: Collaborative Project

Expected Impact: The project should improve the distribution networks hosting capacity of EV and Distributed Energy Resources (DER). It should enable Distribution System Operators (DSOs) in Europe to do more efficient and more cost effective network planning. Furthermore the project should enable intelligent charging of a variety of EV and promote harmonised conditions in the roll out of charging infrastructure. The project should contribute to the monitoring and knowledge sharing schemes of the SET Plan European Electricity Grid Initiative. Furthermore the project is expected to establish cooperation and to coordinate with relevant projects under NMP, Environment, ICT and Transport to jointly support the EGCI PPP.

Additional information: Up to one project may be funded.

Topic ENERGY.2013.7.3.2: Enhanced interoperability and conformance testing methods and tools for interaction between grid infrastructure and electric vehicles

Open in call: FP7-SMARTCITIES-2013

Contents/scope: The aim is to develop enhanced conformance testing methods and tools for the interaction between grid infrastructure and EVs. It includes development of a proposal for a European smart grid reference system to enable the verification of interoperability through efficient tests. Interoperability requirements should include a broad range of charging modalities, grid stability constraints and consumer needs including high energy supplier flexibility and a pan European market for both new and used EV. The work should be based on draft standards developed under M/453, M/468 and M/490. Developed testing methods should have a high degree of reproducibility and they should be validated through round robin tests and at relevant demonstration sites in the framework of the Smart Cities initiative and/or the European Electricity Grid Initiative. The project is expected to give strong contributions to standardisation working groups. It should furthermore ensure a strong link to international standardization and be open to cooperation with US stakeholders to promote cross certification wherever relevant.

Funding scheme: Collaborative Project

Expected Impact: The project should provide manufacturers of EV and EV infrastructure with cost effective conformance testing methods and tools for their products interaction with the European electricity network. Furthermore it should enable consumers to verify their expectations to pan-European interoperability of charging services. The project should contribute to the monitoring and knowledge sharing schemes of the SET Plan European Electricity Grid Initiative. Furthermore the project is expected to establish cooperation and to coordinate with relevant projects under NMP, Environment, ICT and Transport to jointly support the EGCI PPP.

Additional information: Up to one project may be funded.

Calls for proposals - Public-Private Partnerships

Public-Private Partnership "Factories of the Future" - **Cross-Thematic call implemented between NMP and ICT**

Call title: 'Factories of the Future' - 2013

- Call identifier: FP7-2013-NMP-ICT-FoF
- Date of publication: 10 July 2012⁷¹
- Deadline: 4 December 2012⁷² at 17.00.00 (Brussels local time).
- Indicative budget^{73 74}: EUR 230 million from the 2013 budget of which:
 - EUR 160 million from Theme 4 – Nanosciences, Nanotechnologies, Materials and New Production Technologies
 - EUR 70 million from Theme 3 – Information and Communication Technologies (ICT)
- **Topics called:**

Activity/ Area	Topics called	Funding Schemes	Budget (Million EUR)
NMP – Nanosciences, nanotechnologies, Materials and new Production			
FoF.NMP.2013-1	Improved use of renewable resources at factory level	DEMO-targeted collaborative projects	160
FoF.NMP.2013-2	Innovative re-use of modular equipment based on integrated factory design	DEMO-targeted collaborative projects	
FoF.NMP.2013-3	Workplaces of the future: the new people-centred production site	Small or medium-sized collaborative projects	
FoF.NMP.2013-4	Innovative methodologies addressing social sustainability in manufacturing	Coordination and Support Actions (Support action)	
FoF.NMP.2013-5	Innovative design of personalised product-services and of their production processes based on collaborative environments	Large-scale integrated collaborative projects	

⁷¹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

⁷² The Director-General responsible may delay this deadline by up to two months

⁷³ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- the final budget of the call may vary by up to 10% of the total value of the indicated budget for the call; and
- any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

⁷⁴ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority

FoF.NMP.2013-6	Mini-factories for customised products using local flexible production	DEMO-targeted collaborative projects	
FoF.NMP.2013-7	New hybrid production systems in advanced factory environments based on new human-robot interactive cooperation	Large-scale integrated collaborative projects	
FoF.NMP.2013-8	Innovative strategies for renovation and repair in manufacturing systems	Large-scale integrated collaborative projects	
FoF.NMP.2013-9	Advanced concepts for technology-based business approaches addressing product-services and their manufacturing in globalised markets	Small or medium-sized collaborative projects	
FoF.NMP.2013-10	Manufacturing processes for products made of composites or engineered metallic materials	Small or medium-sized collaborative projects	
FoF.NMP.2013-11	Manufacturing of highly miniaturised components	SME-targeted collaborative projects	
ICT – Information and Communication Technologies			
FoF-ICT-2013.7.1	Application experiments for robotics and simulations	<i>Collaborative Projects (IP only) and CSA</i>	70
FoF-ICT-2013.7.2	Equipment assessment for sensor and laser based applications	<i>Collaborative Projects (IP only) and CSA</i>	

- **Eligibility conditions:**

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation: For Collaborative projects, the minimum condition shall be

the participation of 3 independent legal entities, each of which is established in a Member State or Associated Country and no two of which are established in the same Member State or Associated Country.

For Coordination and Support Actions, the minimum conditions shall be:

- Coordination and Support Actions – **coordinating actions**: at least 3 independent legal entities, each of which is established in a Member State or Associated Country, and no 2 of which are established in the same Member State or Associated Country.
- Coordination and Support Actions – **supporting actions**: at least 1 independent legal entity.

- **Additional eligibility criteria**

Topics FoF.NMP.2013-5, FoF.NMP.2013-7 and FoF.NMP.2013-8: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Large-scale integrating collaborative projects **the minimum requested EU contribution must be greater than EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

Topics FoF.NMP.2013-3, FoF.NMP.2013-9 and FoF.NMP.2013-10: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Small or medium-sized collaborative projects **the maximum requested EU contribution must not exceed EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

Topic FoF.NMP.2013-11: SME-targeted Collaborative Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 35% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Topic FoF.NMP.2013-4: The requested EU contribution must not exceed EUR 500 000, and the project duration must not exceed 18 months.

For the ICT topics, each proposal must indicate the type of funding scheme used (IP for Collaborative Projects where applicable; CA or SA for Coordination and Support Actions). See Appendix 2 to the ICT chapter of the Cooperation work programme for further details.

- **Evaluation procedure:**

A one-stage submission procedure will be followed.

Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

Each Theme will remain responsible for its own budget and for the implementation of the respective call topics. This includes drawing up ranking lists per Theme and subsequent negotiation and follow-up of the grant agreements resulting from proposals selected under the respective call topics.

For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

See also Annex 2: Eligibility, Evaluation criteria for proposals and priority order for proposals with the same score⁷⁵.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the EPSS.

- **Indicative evaluation and contractual timetable:**

Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

- **Consortium agreements**

Participants are required to conclude a consortium agreement.

- **Particular requirements for participation, evaluation and implementation:**

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up by each Theme as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Use of flat rates for subsistence costs**

For topics FoF.NMP.2013, and in accordance with Annex 3 to this Work Programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:

https://ec.europa.eu/research/participants/portal/page/fp7_documents,

under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

⁷⁵ For the NMP Programme, and in contrast with Annex 2, at Panel stage, the priority order of the proposals with equal overall scores will be established in accordance with their scores for the S/T Quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If proposals are still tied, they will be prioritised on the basis of the work programme coverage.

Public-Private Partnership "Energy-efficient Buildings" – Cross-Thematic call implemented between NMP and ENVIRONMENT (including Climate Change)

Call title: 'Energy-efficient Buildings' - 2013

- Call identifier: FP7-2013-NMP-ENV-EeB
- Date of publication: 10 July 2012⁷⁶
- Deadline: 4 December 2012⁷⁷ at 17.00.00 (Brussels local time).
- Indicative budget^{78 79}: EUR 116 million from the 2013 budget of which:
 - EUR 110 million from Theme 4 – Nanosciences, Nanotechnologies, Materials & New Production Technologies
 - EUR 6 million from Theme 6 – Environment (including Climate Change)
- **Topics called:**

Activity/ Area	Topics called	Funding Schemes	Budget (Million EUR)
NMP – Nanosciences, nanotechnologies, Materials and new Production			
EeB.NMP.2013-1	Nanotechnology for multifunctional lightweight construction materials and components	Small or medium-sized collaborative projects	110
EeB.NMP.2013-2	Safe, energy-efficient and affordable eco-innovative materials for building envelopes and/or partitions to provide a healthier indoor environment	Large-scale integrated collaborative projects	
EeB.NMP.2013-3	Integration of technologies for energy-efficient solutions in the renovation of public buildings	DEMO-targeted collaborative projects	

⁷⁶ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

⁷⁷ The Director-General responsible may delay this deadline by up to two months

⁷⁸ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- the final budget of the call may vary by up to 10% of the total value of the indicated budget for the call; and
- any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

⁷⁹ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority

EeB.NMP.2013-4	Integrated control systems and methodologies to monitor and improve building energy performance	Large-scale integrated collaborative projects	
EeB.NMP.2013-5	Optimised design methodologies for energy-efficient buildings integrated in the neighbourhood energy systems	Large-scale integrated collaborative projects	
EeB.NMP.2013-6	Achieving high efficiency by deep retrofitting in the case of commercial buildings	Large-scale integrated collaborative projects	
Environment (including Climate Change)			
EeB.ENV.2013.6.3-4	Energy efficient retrofitting and renewal of existing buildings for sustainable urban districts	Collaborative Project	6

- **Eligibility conditions:**

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation: For Collaborative projects, the minimum condition shall be the participation of 3 independent legal entities, each of which is established in a Member State or Associated Country and no two of which are established in the same Member State or Associated Country.

For Coordination and Support Actions, the minimum conditions shall be:

- Coordination and Support Actions – coordinating actions: at least 3 independent legal entities, each of which is established in a Member State or Associated Country, and no 2 of which are established in the same Member State or Associated Country.

- Coordination and Support Actions – supporting actions: at least 1 independent legal entity.

- **Additional eligibility criteria**

Topics EeB.NMP.2013-2, EeB.NMP.2013-4, EeB.NMP.2013-5 and EeB.NMP.2013-6: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Large-scale integrating collaborative projects **the minimum requested EU contribution must be greater than EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

Topic EeB.NMP.2013-1: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Small or medium-sized collaborative projects **the maximum requested EU contribution must not exceed EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

Topic EeB.ENV.2013.6.3-4: In addition to the general eligibility criteria, which are given in Annex 2 of the work programme, for collaborative projects in the maximum EC funding requested must not exceed EUR 3 million. The following additional eligibility criterion will be also applied: Projects will only be selected for funding on the condition that the estimate EU contribution going to SMEs is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

- **Evaluation procedure:**

A one-stage submission procedure will be followed.

Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

Each Theme will remain responsible for its own budget and for the implementation of the respective call topics. This includes drawing up ranking lists per Theme and subsequent negotiation and follow-up of the grant agreements resulting from proposals selected under the respective call topics.

For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

See also Annex 2: Eligibility, Evaluation criteria for proposals and priority order for proposals with the same score⁸⁰.

⁸⁰ For the NMP Programme, and in contrast with Annex 2, at Panel stage, the priority order of the proposals with equal overall scores will be established in accordance with their scores for the S/T Quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion. If proposals are still tied, they will be prioritised on the basis of the work programme coverage.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the EPSS.

- **Indicative evaluation and contractual timetable:**

Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

- **Consortium agreements**

Participants are required to conclude a consortium agreement.

- **Particular requirements for participation, evaluation and implementation:**

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up by each Theme as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Use of flat rates for subsistence costs**

For topics EeB.NMP.2013 and EeB.ENV.2013, and in accordance with Annex 3 to this Work Programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:

https://ec.europa.eu/research/participants/portal/page/fp7_documents,

under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

Public-Private Partnership "Green Cars": Call implemented by NMP Theme

Call title: Materials for Green Cars - 2013

Call identifier: FP7-2013-GC-MATERIALS

Date of publication: 10 July 2012⁸¹

Deadline: 4 December 2012⁸² at 17.00.00 (Brussels local time).

Indicative budget ^{83 84}: EUR 20 million from the 2013 budget of which:

- EUR 20 million from Theme 4 – Nanosciences, nanotechnologies, materials and new production technologies (NMP).

The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call.

In case the budget can not be consumed (totally or partially), the remaining budget will be returned to each FP7 theme according to its respective contribution.

Topics called

Activity/ Area	Topics called	Funding Schemes	Budget Million EUR
GC.NMP.2013-1	Improved materials for innovative ageing resistant batteries	Large-scale integrated collaborative projects	20

• Eligibility conditions:

The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation: For Collaborative projects, the minimum condition shall be the participation of 3 independent legal entities, each of which is established in a Member State or Associated Country and no two of which are established in the same Member State or Associated Country

• Additional eligibility criteria:

⁸¹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁸² The Director-General responsible may delay this deadline by up to two months.

⁸³ A single reserve list will be constituted if there are a sufficient number of good quality proposals. It will be used if extra budget becomes available.

⁸⁴ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

Topic GC.NMP.2013-1: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Large-scale integrating collaborative projects **the minimum requested EU contribution must be greater than EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

- **Evaluation procedure:**

A one-stage submission procedure will be followed.

Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

Further information on elements to be taken into account in the evaluation is given under the respective topic descriptions.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the EPSS.

- **Indicative evaluation and contractual timetable:**

Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

- **Consortium agreements**

Participants are required to conclude a consortium agreement.

- **Particular requirements for participation, evaluation and implementation:**

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

- **The forms of grant and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Use of flat rates for subsistence costs**

In accordance with Annex 3 to this Work Programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at: https://ec.europa.eu/research/participants/portal/page/fp7_documents, under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

Public-Private Partnership "Green Cars": Call implemented by ICT Theme

Call title: "ICT for Green Cars"

Call identifier: FP7-2013-ICT-GC

- Date of publication⁸⁵: 10 July 2012
- Deadline⁸⁶: 4 December 2012 at 17.00.00 (Brussels local time)
- Indicative budget⁸⁷: EUR 40 million⁸⁸

See indicative budget breakdown in Section 7 of the ICT work programme.

- Topics called:

Activity/ Area	Objectives	Funding schemes	Budget
ICT – Information and Communication Technologies			
GC.ICT.2013.6.7	Electro-mobility	<i>Collaborative Projects (IP, STREP) and Coordination and Support Actions (CSA)</i>	40

An overview of all PPP-related topics is provided in Annex 5.

- Eligibility conditions:

The general eligibility criteria are set out in Annex 2 of this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation. See Appendix 1 of the ICT work programme for further details on the minimum number of participants.

- Evaluation procedure:

⁸⁵ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁸⁶ The Director-General responsible may delay this deadline by up to two months

⁸⁷ The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:

- The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call

⁸⁸ Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

A one-stage submission procedure will be followed.

Proposals will be evaluated in a single-step procedure. Proposals could be evaluated remotely with the consensus sessions being held in Brussels.

For this call the following criteria and thresholds are applied: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

See also Annex 2: Eligibility and evaluation criteria for proposals and priority order for proposals with the same score.

In order to ensure industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation.

Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the EPSS.

- Indicative evaluation and contractual timetable:

Evaluation of proposals: January 2013. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of March 2013.

- Consortia agreements:

Consortia agreements are required for *all* actions.

- Particular requirements for participation, evaluation and implementation:

As a result of the evaluation, a ranked list of proposals retained for funding will be drawn up by Theme as well as a reserve list of proposals that may be funded in case budget becomes available during negotiations.

The forms of grants and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.