WORK PROGRAMME 2013

COOPERATION

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(European Commission C(2012)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 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 programmes[2];
- 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.

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 *(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)**
All funding schemes		• *Soundness of concept, and quality of objectives*	• Appropriateness of the management structure and procedures • Quality and relevant experience of the individual participants	• *Contribution, at the European [and/or international] level, to the expected impacts listed in the work programme under relevant topic/activity*
Collaborative projects		• *Progress beyond the state-of-the-art* • Quality and effectiveness of the S/T methodology and associated work plan	• Quality of the consortium as a whole (including complementarity, balance) • Appropriateness of the allocation and justification of the resources to be committed (staff, equipment,…)	• Appropriateness of measures for the dissemination and/or exploitation of project results, and management of intellectual property.
Networks of Excellence		• *Contribution to long-term integration of high quality S/T research* • Quality and effectiveness of the joint programme of activities and associated work plan	• 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	• 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**	• Contribution to the co-ordination of high quality research • Quality and effectiveness of the co-ordination mechanisms, and associated work plan	• 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,…)	• Appropriateness of measures for spreading excellence, exploiting results, and dissemination knowledge, through engagement with stakeholders, and the public at large.
	SA	• Quality and effectiveness of the support action mechanisms, and associated work plan		
Research for the benefit of specific groups		• 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	• 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,…)	• 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 regulation[3] (article 115) and its implementing rules[4] (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 programmes[8].

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 Programme[9] and the 'Cooperation' Specific Programme[10], the provisions of Article 120(2) of the Council Regulation on the Financial Regulation applicable to the general budget of the European Communities[11] 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 programmes[13].

- 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 2012[14].
- Deadline: 28 February 2013, at 17.00.00, Brussels local time[15].

Indicative budgets and Topics[16]:

A total of EUR 61.1 million[17] 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

[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 programmes[19].

- 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.

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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 Experts[23])

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 (Subscription[24])

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 Foundation[26].

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

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[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 innovation[27] (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 2010[28]. On this basis, the European Council, in its conclusions of 4 February 2011 on Innovation[29], 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

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[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 piece[30]. 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 EIB[31].

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-adverse. 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 2012[32] 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 Programme[33] – and related investments needs.

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[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 Agreement[34]. 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 Programme[35]. 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 online[36]. 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 interest[37].

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 Themes[38].

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 2007-2012[39], 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 Programme[40] and 150 million to Cooperation Specific Programme[41]. 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 2011[42]. 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 Innovation[43]. 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 Competiveness 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 RSFF[44].

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 Programme[45], 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 Programme[48]. 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 *broken down as follows:*
*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 *broken down as follows:*
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 INITIATIVES[49]*:*

- 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 CO_2 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 NMP[50] and ICT[51] Themes;*
- *The 'Energy-efficient Buildings' initiative involves financial support from the NMP and Environment Themes[52];*

[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 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 scheme[53]. Project partnerships that include independent organisations from at least three IMS regions[54] 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 lay-out. 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 regions[56] 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 CO_2 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 CO_2 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 Cluster[58].

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 activities[59].

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 consumption[60].

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.

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 CO_2 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 buildings[61] and the Roadmap to a Resource-Efficient Europe[62]. 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 CO_2 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 cites 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 Vocabularies[64].

- 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 Theme[66], EUR 40 million from the ICT Theme[67] and EUR 52.45 million from the Transport Theme[68].

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-1and call FP7-TRANSPORT-2013-MOVE-1
[69] see Theme 3 (ICT) and Thene 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 by 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 competiveness 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 convoying 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 PEMS[70] 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 transhipment 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 transhipment 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**

<u>Call title</u>: 'Factories of the Future' - 2013

- Call identifier: FP7-2013-NMP-ICT-FoF
- Date of publication: 10 July 2012[71]
- Deadline: 4 December 2012[72] 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	*Collaborative Projects* (*IP only) and CSA*	**70**
FoF-ICT-2013.7.2	Equipment assessment for sensor and laser based applications	*Collaborative Projects* (*IP only) and CSA*	

- **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 score[75].

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 2012[76]
- Deadline: 4 December 2012[77] 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 score[80].

[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 2012[81]

Deadline: 4 December 2012[82] 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 publication[85]: 10 July 2012
- Deadline[86]: 4 December 2012 at 17.00.00 (Brussels local time)
- Indicative budget[87]: EUR 40 million[88]

  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	*Collaborative Projects (IP, STREP) and Coordination and Support Actions (CSA)*	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.