

WORK PROGRAMME 2010

COOPERATION

THEME 4

***NANOSCIENCES, NANOTECHNOLOGIES, MATERIALS AND
NEW PRODUCTION TECHNOLOGIES - NMP***

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Objective

The principal objectives of this Theme are to improve the competitiveness of European industry and to generate knowledge to ensure its transformation from a resource-intensive to a knowledge-intensive base, by creating step changes through research and implementing decisive knowledge for new applications at the crossroads between different technologies and disciplines. This will benefit both new, high-tech industries and higher-value, knowledge-based traditional industries, with a special focus on the appropriate dissemination of RTD results to SMEs. These activities are concerned with enabling technologies which impact all industrial sectors and many other Themes of the Seventh Framework Programme.

I CONTEXT

I.1 Approach for 2010

A key feature of the 2010 Work Programme (WP) is the participation in actions within the European recovery package. Indeed, as an answer to the recent world-wide economic crisis, these pluri-annual actions launched by the EU at the end of 2009 correspond to the four priority areas of the Lisbon strategy, namely: people, business, infrastructure & energy and research & innovation. The action on research and innovation mainly includes a support of innovation in manufacturing, the construction industry and the automobile sector. This will be implemented under the scheme of three initiatives of Public-Private Partnerships (PPPs), namely: "Factories of the future", "Energy-efficient buildings" and "Green cars". The objective is to promote the convergence of public interests with industrial commitment and leadership to define strategic research activities in key sectors. This first year of PPP implementation required an immediate reaction and benefited from the ongoing definition of the 2010 work programme which has been designed to complement the objectives of 2009 WP.

The nature of industrial technologies in the NMP programme made it a very appropriate tool to address, at different degrees, the core objectives of all three PPPs, in cooperation with other RTD Themes and other services. The 2010 exercise of PPPs will see the involvement of the NMP Theme with an amount of about EUR 100 million through the transfer and adaptation of a number of RTD topics to the RTD efforts associated to the recovery package. This has resulted to a final NMP programme, complementary to the one of 2009, and it is described below.

Beyond the NMP participation in the PPP initiatives, the core objective of Theme 4 '*Nanosciences, Nanotechnologies, Materials and new Production Technologies – NMP*' remains stable, that is to fund research, development, demonstration, and coordination projects that will contribute, either on their own or by enabling further development, to **the transformation of European industry** from a resource-intensive to a knowledge-intensive industry, thus meeting the challenge imposed by the new industrial revolution and competition at global level, as well as environmental challenges. This transformation is essential in order to produce, in a sustainable manner, high added value products, embedding European cultural values through design and this in turn is essential not only to prevent the relocation of European industry to other areas of the world, but also create new industries, and hence growth and employment within Europe. The competitiveness of more mature industries is also largely dependent on their capacity to integrate knowledge and new technologies.

The competitiveness of European industry is promoted by **generating step changes in a wide range of sectors and implementing decisive knowledge for new applications** at the crossroads between different technologies and disciplines. Research will be focused on generating **high added-value products and related processes and technologies** to meet customer requirements as well as growth, public health, occupational safety, environmental protection, and societal values and expectations. The **sustainability** concern (balance in economic growth, social well-being and

environmental protection) resides at the centre of any industrial RTD development. Environmental challenges such as climate change and resources scarcity are the sources of both constraints and opportunities for technological developments.

Furthermore, during the last few years, much effort has been spent by the stakeholders within the European Technology Platforms (ETPs) around the definition of strategic research in about 30 EU sectors. Due to its multisectoral nature, the NMP Theme is the most concerned by the ETPs. Integrating the long-term vision that industry itself provides will greatly enhance the effectiveness of RTD related to long-term challenges, also allowing benefits for additional sectors and other stakeholders to be included, through the development of generic technologies. A key issue will be to integrate competitiveness, innovation and sustainability into the NMP related research activities as well as initiatives capable of fostering the dialogue with society at large, together with education and skills development.

For the reasons described above, the NMP work programme 2010 is characterised by the same number of topics compared to the previous year. These topics are proposed on the basis of the NMP multiannual strategy as defined in the Framework Programme and the Specific Programme Decisions, as well as on the NMP project portfolio: the research activities proposed for 2010 either address topics not yet covered or topics complementary to previous work programmes. The international dimension remains an important aspect of the NMP work programme 2010.

In ensuring continuity with previous programmes and calls, NMP has evolved on the basis of the acquired experience, of the challenges imposed by the needs of European industry as well as of the its projects' portfolio. It is clear that with this very wide applicability, selective choices will have to be made as the Theme evolves over the duration of the Framework Programme and to address emerging scientific and societal issues as well as new technological challenges. The strategic approach is strongly focused on demonstrable added value in EU industry arising from a proper appreciation of the potential of nanotechnologies, materials and production technologies. It will be essential to ensure the uptake of knowledge generated through effective dissemination and use of the results.

Theme 4 is structured as follows:

a) Three thematic activities:

- **Nanosciences and Nanotechnologies** activity in 2010 consists of 6 RTD topics and provides support to research and innovation to as many areas, most of them addressing aspects of: enhancing environmental sustainability, namely: "green nanotechnology", thermoelectric energy converters, added value to mining, impacts on health and the environment and methodologies for management the risks of nanoparticles. Finally RTD on novel tools specifically targets SMEs while one coordinating action will handle best practices for communication and governance.

- **Materials**, in 2010 will focus on a number of RTD topics, spreading to a large diversity of areas, from the design of tailored properties of organic-inorganic hybrids (for electronics and photonics) and scaffolds for bioactive materials (tissue regeneration), to chemical engineering (membranes for catalytic reactors) and materials for energy storage, as well as modelling work on crystalline materials.

- **New Production Technologies** is the NMP RTD area that was called to largely contribute with the initially designed NMP topics to the recovery package PPPs, namely those of "Factories of the future" and "Energy-efficient buildings." The two topics that still remain within the NMP programme *per se* handle very specific issues, namely: industrial models for sustainable and efficient production and manufacturing systems based on flexible materials.

b) **'Integration'**, a fourth activity as such, aims at developing new applications and new approaches in different industrial sectors by combining research from the first three activities. This is a *'deliverables-driven'* integration to generate high added value products, with particular - but not

exclusive - reference to industrial and regulatory needs and challenges identified with the European Technology Platforms. For 2010, the focus is on two very different areas of nanotechnology-based solutions (systems for combating cancer, development of multi-parameter sensors) and two areas of manufacturing technologies (development of formulated products, fibre-based products by flexible manufacturing, the latter specifically targeting SMEs). Finally, three ERA-NETs are foreseen (on nanotechnologies, including nanotoxicology, on manufacturing, a follow on activity of last year's programme and on catalysis) and a coordination action related to European Technology Platforms (ETPs).

I.2 Research relevant for SMEs

The NMP Theme is particularly relevant to SMEs from within all industrial sectors due to their needs and roles with respect to advanced technologies. SMEs can participate in each and every call for proposals implemented by the NMP Theme. Moreover, **dedicated calls for Collaborative Projects targeted to SMEs** are implemented with the aim of reinforcing their scientific and technological base and of validating innovative solutions. Priority will be given to proposals demonstrating that SMEs play a leading role and that they represent in the order of 35% or more of the requested EC contribution.

I.3 International Cooperation

The increasingly important international dimension of industrial research requires a well-coordinated approach to working with third countries and in international forums, in particular where there is evident mutual benefit, either in terms of excellence of the research and/or in terms of an increased impact. Some topics have been specifically highlighted as being research areas which are particularly well suited for international cooperation. In addition, specific actions may include:

- coordinated calls to address objectives of mutual interest (for example with countries having signed an S&T cooperation agreement);
- specific initiatives (such as technical workshops and similar events, in particular in the fields of materials sciences and nanomaterials, in order to identify topics of mutual interest for future coordinated calls and/or for Specific International Cooperation Actions - SICAs¹) to promote the participation of emerging economies and developing countries (see Annex 1 – International Cooperation Partner Countries - ICPC);
- the Intelligent Manufacturing Systems (IMS) scheme²;
- the development of internationally harmonised standards and nomenclature;
- dialogues with major countries on a '*code of conduct*' for the responsible and safe development of nanotechnology;
- coordinated actions with researchers in other world regions.

Initiatives to coordinate and exchange research data are encouraged (such as in the environmental, safety and health issues for nanotechnologies), paving the way for a common understanding of regulatory needs by policy makers across the world.

¹ SICA are Collaborative Projects where the consortia must include at least four independent legal entities of which at least two must be established in different Member States or Associated countries and at least two must be established in different ICPC countries (Art. 7 of the Regulation 1906/2006 of the European Parliament and of the Council, laying down the rules for the participation of undertakings, research centers and universities).

² For more information on IMS: <http://cordis.europa.eu/ims>. The European Community participates according to Article 108(2)(d) of the Financial Regulation.

I.4 Cross-thematic approaches and coordination with National and regional activities

The cross-sectoral nature of NMP requires close attention and cooperation with several other Themes of the Seventh Framework Programme, in particular Health, Food, Security, Space, ICT, Energy, Environment and Transport. Cross-thematic areas are addressed through **joint calls** published jointly with other Themes, thus ensuring that the same objectives are achieved and through **coordinated calls** to achieve complementary objectives via a coordinated approach. Specific actions to **coordinate programmes and joint activities** conducted at national and regional level will also be carried out through *ad hoc* schemes (in particular ERANET and ERANET-*plus*) so as to promote convergence of research programmes and to reinforce critical mass. Coordination will also be encouraged in areas such as metrology, toxicology, standards and nomenclature, for example, to foster synergies within and between the emerging European Technology Platforms, as well as with other schemes such as COST and Eureka.

I.5 Theme specific information

The work programme 2009 introduces each area and gives a description of the topics for which project proposals are invited. For each topic, the work programme specifies which funding scheme is to be used:

- **Collaborative Projects:** *Small or medium scale focused research projects* and *Large scale integrating projects* (which may include additional activities such as demonstration, innovation-related activities, education and training) are implemented via separate calls. For each funding scheme there are upper and lower limits respectively on the requested EC contribution as specified in Section III on Implementation of calls. **It is important to note that these funding limits are applied as eligibility criteria.** PPPs on their side, will be implemented through collaborative projects without specification of ceilings.

- **Coordination and Support Actions** may relate to coordination, networking or supporting activities at European and international, national or regional level. The organisation of events, studies, where relevant, organisation and management of joint or common initiatives may be included, as well as activities aimed at supporting the implementation of the Theme, such as dissemination, information and communication and activities to stimulate and encourage the participation of civil society organisations.

The forms of the grant to be used for the funding schemes in this part of the work programme are stated in Annex 3.

NMP focuses on a wide range of industrial sectors and on a wide range of RTD domains.

- The **range of industrial sectors** evidently covers those key sectors which concern industrial production, such as manufacturing and chemical processing, but it also extends to traditional sectors (construction, textiles, etc), which are moving up the high-technology innovation stream, and to other sectors striving to maintain and increase their leading position within the EU (electronics, photonics, medical equipment, etc.). Manufacturing and Construction have been specifically and particularly addressed through the PPP initiatives.
- The **RTD domains** addressing the RTD challenges for a strategic industrial transformation range from (a) nanosciences and nanotechnologies that are becoming one of the new paradigms and enabling factors across virtually all fields of science and technology, to (b) materials that are rapidly acquiring the knowledge-based features, to (c) the products/production-related technologies that are pushing towards the 'factory of the future', something that will strongly underpin the revolution that is needed, as it is was illustrated by the emergence of the "Factories of the future" PPP initiative within the recent EU recovery package".

Industrial involvement is crucial in order to safeguard the industrial relevance of the activities supported in the NMP Theme. Direct industrial participation as partners in projects is encouraged across all topics of the NMP Theme.

The description of each topic, in addition to the technical content and scope, includes any participation requirements (such as industrial participation, where appropriate) as well as related expected impact(s) for the topic.

The **submission** and **evaluation** of proposals for Collaborative Projects (including those dedicated to SMEs) will be organised in **two stages**. The rationale for this is due to the specific nature of Theme 4 – NMP, which is multidisciplinary, cross sectoral and SME intensive, for which a 'bottom-up' approach is encouraged. The calls for the PPP initiatives will adopt a single-stage scheme to accelerate the process within this urgent recovery plan.

The first stage proposal should focus on the S & T content and on clear identification of the intended results, their intended use, and the expected (economic, social, environmental, etc.) impact. It will be evaluated on the basis of two criteria: **scientific quality** and expected **impact**. Coordinators of retained proposals in stage 1 will be invited to submit a complete proposal that will then be evaluated against the entire set of evaluation criteria.

Participation of women in research and gender dimension

The pursuit of excellence in scientific knowledge and in its technical application towards socially acceptable products, processes and services requires greater inclusiveness of a diversity of perspectives. In particular the overall process of transforming European industry will not be achieved without the talent, perspectives and insights that can be added by a more balanced participation of women and the integration of gender issues in RTD activities.

Increasing the diversity of perspectives particularly (but not exclusively) to gender issues at the level of the NMP objectives and topics may have a particular relevance in areas such as new business and organisational models, increasing the level of comfort and user friendliness provided by materials and industrial products, improved understanding of toxicity and risk and in all areas where industrial technologies research is aimed at medical application (e.g. nanomedicine - diagnostics, drug delivery or regenerative medicine). The NMP Theme is committed to undertake specific measures to ensure practical uptakes of this issue together with industry.

II CONTENTS OF CALLS

II.1 Activity 4.1 Nanosciences and Nanotechnologies

Nanosciences and nanotechnologies are widely seen as a multi-disciplinary and integrative RTD approach having huge potential to improve competitiveness and sustainable development across a wide range of industrial sectors. Here the strategic objective is twofold: to generate new knowledge by studying phenomena and manipulation of matter at the nanoscale, including biosciences and understanding or imitating the natural processes at nano-metric scale; and to promote innovation by developing nanotechnologies that will enable the manufacturing of new nanotechnology-based products and/or innovative delivery of services. This will lead to a new generation of high added value, competitive products and services with superior performance across a range of applications.

The second half of FP7 will be marked by a gradual shift towards more application oriented research as nanotechnologies from the laboratory environment towards applications in various industrial sectors are evolving. The initial focus will be on the environment as a whole: energy efficiency and sustainable energy production and the emergence of sustainable products (material and energy consumption, environmental impact, etc). Continued support is directed towards applications in the health-care field and development of nano-analytical tools. Interdisciplinary, integrating theoretical and experimental approaches must be promoted.

At the same time this activity will also investigate the impact of nanotechnology on society, human health and the environment, as well as look into the relevance of nanoscience and technology for the solution of societal problems as well as the societal acceptance of nanotechnology. This will include research on potential ethical, public health, occupational safety and environmental protection implications as well as safety, monitoring and sensing, metrology, nomenclature and standards which are becoming increasingly important to pave the way for industrial applications. Actions will be launched to implement the Commission's integrated and responsible approach as well as the measures outlined in the associated Action Plan 'Nanosciences and nanotechnologies'.

Knowledge gaps in relation to the risk assessment of nanomaterials and nanotechnologies could currently constitute an impediment to the smooth implementation of regulatory requirements. Coherently, actions may be funded that will facilitate this, thus enhancing industry's capability to provide the full benefits of nanotechnologies, in conditions of trust of and transparency to citizens.

II.1.1 Nanosciences and converging sciences

Long-term interdisciplinary research into understanding phenomena, mastering processes and developing leading edge research tools and techniques is vital for the future of EU industry. The main objective is to support the development of new knowledge by studying the phenomena and manipulation of matter at the nanoscale in order to open new horizons. The research also focuses on new structures and systems with novel or pre-defined properties and behaviour with attention to possible applications. This involves interdisciplinary approaches in collaborative research that may include several fields of sciences or disciplines such as: biological sciences, physics, chemistry, electronic, engineering, mathematics, environmental and safety related disciplines, cognitive sciences, social sciences, etc.

NMP.2010.1.1-1**Support to dialogue and engagement for responsible social acceptance of nanotechnology**

Technical content/scope: Providing European citizens with appropriate communication on nanotechnology to prepare the dialogue of stakeholders on the social challenges of nanotechnology has been the focus of CSA projects negotiated in 2008, with a specific focus on young people. Major studies and scholars underline that communication should enjoy continuity to build on results in order to build on responsible social support of nanotechnology: in this light, promoting initiatives for engagement is the second step of this process, as involving key stakeholders on dialogue about the social challenges of nanotechnology is part of the European Commission's Action Plan. The proposed CSA should aim at engaging stakeholders (e.g. researchers, scientists, industry, social partners, funding bodies, regulatory agencies, standardisation bodies, insurers, NGOs, opinion-makers, influencers, information gate-keepers, educators, nano-consumers, lay public) on debate and dialogue on key societal issues associated with nanotechnology, designing and implementing the most appropriate tools to attain consensus on both issues and their urgency. Pedagogy in nanoscience could be of importance. Nanotechnology and related societal issues should be addressed in a balanced way, so as to: (i) provoke a sound, science-based dialogue via appropriate media-based public engagement tools, e.g. television, radio, web, blogging, citizen conferences, dedicated public events; (ii) provide the EC services with insights and recommendations to improve governance by building on awareness and responsible social acceptance of nanotechnology; (iii) providing inputs for both design and implement the EC Action Plans on nanotechnology. A focus on one or more nanotechnology social issues or applications which are most relevant for the stakeholders is possible. Tools dedicated specifically to engage industry, NGOs, nano-consumers and media with the objective of building consensus on nanotechnology issues relevant for consumers would also be eligible.

A maximum of one coordination action will be financed with a recommended duration of 18 months years and a maximum EC contribution of EUR 0.8 million. Proposals with a higher request for EC contribution will be judged as ineligible.

Funding Scheme: Coordination and support actions (coordinating actions)

Expected impact: (i) support measurable dialogue and contribute to create consensus of various stakeholders on societal impacts and responsible acceptance of nanotechnology; (ii) enhance support to good governance in nanotechnology, including risk governance; (iii) contribute to the implementation and further development of the European Commission's action plan on nanotechnology.

II.1.2 Nanotechnologies and converging technologies

Europe holds a strong position in nanosciences that needs to be translated into a real competitive advantage for European industry. Exploration of new concepts and approaches for sectoral applications, including the integration and convergence of emerging technologies at the nanoscale, are needed to promote the development of an RTD-intensive European nanotechnology related industry and the uptake of nanotechnologies in existing industrial sectors to promote the step change in industrial performance that is needed.

The main objective is to promote industrial innovation by developing nanotechnologies that will enable both the manufacturing of new, higher performance 'nano-enabled' services, products, components, devices and systems across a range of applications and the development of totally new manufacturing processes. Whenever appropriate, an interdisciplinary approach integrating

different technologies, sciences or disciplines should be considered including health, safety and environmental issues as well as modelling, nomenclature, metrology and standardisation.

NMP.2010.1.2-1 Novel tools integrating individual techniques for real time nanomaterials characterisation

Technical content/scope: The knowledge-based development of innovative nanostructured materials, and of the related products and devices, strongly depends on a reliable characterisation of the chemical and physical properties that are governed by nanoscale effects. New techniques and instruments integrating individual techniques for accurate measurement of dimensions, characterisation of materials and elucidation of structures are required. The research should be focused on the development of real time characterisation tools (including high-throughput) for the possible incorporation in production lines for nanoparticles, nanostructured materials or nanostructures. The new tools should significantly improve the resolution for size and/or shape characterisation and provide probes for novel properties of the nanostructured material (e.g. core-shell nanoparticle analysis) in ambient or near-ambient conditions. The reliability and repeatability of the characterisation tool must be sufficient to support automation and provision of data for production line performance optimisation in real time. Proposals could include demonstration activities for integration of the new characterisation device(s) in existing production lines.

Additional activities other than research could be included as appropriate, in particular, development of outputs that could form the basis of standards promoting innovation in research and industry is encouraged.

SME dedicated collaborative projects are specifically designed to encourage SME participation in research and innovation representing the complete value added of the targeted fields. Research and innovation activities need to be covered by the projects. In each project, at least 35% of the EC contribution is expected to be allocated to the participating SMEs. The projects will be led by SMEs with R&D capacities but the coordinator does not need to be an SME. The participating SMEs should have the decision making power in the project management. 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: i) In terms of technology development, make available new or significantly improved "fit for purpose" tools for integration in nanomaterials production lines/processes; ii) contribute to production automation of those lines/processes, leading to higher production volumes, improved reliability and repeatability of produced nanomaterials and lower production cost; (iii) contribute to deeper understanding of the behaviour of nanoscale production processes; (iv) contribution to standardisation in the nano metrology field; (v) contribute to long-term innovation of the industrial processes facilitating the design, engineering and manufacturing of next generation high value-added products.

NMP.2010.1.2-2 Substitution of materials or components utilising "green nanotechnology"

Technical content/scope: Nanotechnology provides new effects or functionalities which are not based on the chemical properties of the related material but on the physical properties caused by its size and shape. Although nanotechnological approaches often cannot lead to direct substitution of a particular substance, they may lead to a safer and more environmentally friendly product or process³. The objective of the topic is to contribute to reduction on the demand of scarce or non-environmentally friendly raw materials, elimination of use of hazardous substances in production

³ See European Parliament Scientific Technology Options Assessment (STOA) report "The role of nanotechnology in chemical substitution, 2006

processes or the reduction of non-eco waste material, utilising nanotechnology to replace existing production routes or families of products. A further objective is to establish a connection in a systematic way between a hazardous substance and a particular nanotechnology application which could facilitate the substitution of this substance. The synthesis of biodegradable nanostructured hybrid composites is one of the potential routes for improving the end-use properties of virgin products. They can also be employed in many biomedical and pharmaceutical applications due to their biocompatibility. Thermal stability, mechanical strength, low melt viscosity and degradation kinetics are among properties that should be controlled. The research should therefore focus on one or more materials or components: surfactants, green-additives, advanced bio-degradable nanostructured materials, novel functionalised nano-composites that can replace presently employed non-environmentally friendly hazardous chemicals in compounds and can be utilised in consumer goods for everyday life. The development work must go beyond proof of concept level. Due consideration of the risks and benefits of substitution must be included and the safety of the proposed solution must be ensured for the full product life cycle (production, use, disposal/recycling). The cost (including material and energy efficiency) and technical performance of the proposed solutions must also be assessed.

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.

Funding Scheme: Small or medium-scale collaborative projects.

Expected impact: In terms of technology development, to demonstrate the viability of the "green nanotechnology" concept to enhance environmental sustainability of manufacturing processes; to promote the creation of markets for products and processes utilising "green nanotechnology"; in the long term, to provide a significant contribution to the reduction on the demand of scarce or non-environmentally friendly raw materials, elimination of use of hazardous substances in production processes and the reduction of non-eco waste material.

NMP.2010.1.2-3 Thermoelectric energy (TE) converters based on nanotechnology

Technical content/scope: There is growing awareness of the potential that nanosciences and nanotechnologies present to produce breakthrough advances for sustainable energy conversion processes, thus responding positively to the environmental and climate change challenges. There are common scientific problems to solve and technological challenges for a wide range of energy technologies, including renewables, to obtain reliable, clean and affordable energy. Thorough investigations of the phenomena at molecular level are essential to obtain improved processes in terms of energy efficiency increase thereby bringing real breakthrough to these technologies. Complementary to the previous call on photovoltaics, the focus of the present topic is thermoelectricity. Research should focus on the investigation of the underlying nano-metric processes and the nano-scale effects for thermoelectric energy harvesting, with the objective of reducing interface resistance, improving heat transfer to/from surfaces and substantially improving the ZT value (thermoelectric figure of merit) of thermoelectric materials with respect to the state-of-the-art. Recently substantial improvements in the ZT value have been obtained in low dimensional structured materials. The objective is to achieve comparable performance in nanostructured thick films or bulk TE materials for higher scale power generation (or cooling). The integration of energy harvesting with materials and goods as well as modelling of the nanostructured material properties can also be addressed (up to proof of concept, for initial proof of concept also micro-nano devices could be used) in the proposed projects. Proof of concept should also consider reliability and life cycle cost.

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.

Research must consider the Health, Safety and Environmental aspects of the manufactured nanoparticles as well as the composites that would be part of the researched TE converters.

Funding scheme: Small or medium-scale focused research projects

Expected impact: To significantly improve the efficiency of Seebeck effect thermo generators (typical range 5 – 10 %) through improved TE materials; achieving a $ZT > 3$ would give thermoelectric converters wide-scale application potential in power generation and refrigeration requiring a high power output. For example, in a vehicle using an internal combustion engine, nearly two-thirds of the chemical energy of fuel is wasted as heat from the tailpipe or radiator of a vehicle and could be recovered with thermoelectric converters. In hybrid vehicles, this could be used to provide propulsive power leading in significant savings. Further, thermoelectric converters could be used to recover waste heat of power generation plants, leading to significant cost savings and environmental benefits.

This area will also contribute in implementing the PPP initiative "Energy-efficient buildings"

NMP.2010.1.2-4 Adding Value to Mining at the Nanostructure level (Coordinated call with Mexico)

Technical content/scope: Sustainability and new value-added products are important for the mining sector. Nanotechnology is opening the way to novel cost-effective, environment-friendly technological solutions with high industrial and societal impact. Both the EU and the Latin American countries have remarkable experience and potential for further progress in this complex and challenging field, and more intense synergies need to be fostered. Research should focus on

- a) The development and production of nanostructures (thin films, nanoparticles, nanotubes, nanofibres, 3D nanostructures and others) using materials from the mining industry (e.g. Ag, Bi, Zn, ZnO, Cu, Sr, Ba); fabrication of nanocomposites in different matrices, such as polymeric, glasses or ceramic; characterization and testing of the functionality of the nanocomposites, for example in terms of mechanical, optical, magnetic and bactericide properties of the systems; or
- b) Large scale, low cost synthesis of metallic or non-metallic nanoparticles from mining sub-products; low cost efficient methods for nanoparticle dispersion in particular in polymeric matrices; characterization and testing of the functionality of the nanocomposites, for example in terms of gas barrier properties, UV protection or catalytic activity.

Research must consider the Health, Safety and Environmental aspects of the manufactured nanoparticles as well as the composites from life cycle perspective.

The research activities supported have to go beyond conventional approaches, and be highly novel, very ambitious and of long term implication. The potential impact on the cost effective and high yield production and application has to be clearly demonstrated. The action should also provide a robust platform for establishing contacts between researchers of both regions in academia, public research laboratories and industry in order to identify and enhance complementary interests. In addition, the action should facilitate the bringing together of core competencies and expertise in order to build research partnership. All proposals shall address the entire value chain from raw materials' extraction to the potential application.

The maximum EC funding must not exceed EUR 2 million, including EC funding to Latin American ICPC; Mexican participants will be funded by the Mexican National Council on Science

and Technology. Proposals which do not include the minimum number of Mexican partners will be considered ineligible (see call fiche). A balanced effort between the European and Mexican participants as well as other Latin American participants represents an added value to the activities and this will be reflected in the evaluation under the criteria 'Impact' and 'Implementation'. In order to ensure industrial relevance and impact of the research effort, the active participation and leadership of industrial partners represents an added value to the activities and this should be reflected in the evaluation.

Funding Scheme: Small or medium-scale focused research projects

Expected impact: The expected impact of these projects will be judged in the radical upgrade of properties of the nanostructured materials based on mining products or sub-products. It should create the critical mass of human resources and competence to achieve success in generating new knowledge beyond the state of the art to contribute to industrial innovation for the benefit of both regions. Significant improvement is expected in the mechanical, optical, magnetic, electric and biomedical properties of the nanocomposites based on mining products or sub-products embedded into different matrix systems. These new nanostructured materials and their properties are expected to lead to new products with improved functionalities, such as high performance ceramic tiles, reinforced and intelligent glasses, recyclable polymers, bactericide materials, high resistance - low weight stainless steels, etc. Furthermore, the improved thermal, electrical, optical or catalytic properties of the nanostructured materials should contribute to the development of knowledge-based and energy saving products and devices manufactured using mining products, leading to the creation of new high-tech competitive industry in the long term.

II.1.3 Health, Safety and Environmental Impacts

The main objective is to support the scientific assessment of the potential health, safety and environmental risks associated with nanotechnology-based materials and products at the earliest possible stage. This involves the generation of quantitative data on toxicology and ecotoxicology and methodologies for generating data. Test methods, exposure assessment and risk assessment methods may need to be developed or modified to be applicable to nanomaterials, as well as methodologies for life cycle analysis. In addition, analytical methods might not be fully suitable and therefore also the development of suitable techniques, devices and instruments for measurement are addressed. Research activities will thus contribute to closing the knowledge gap, providing the basis for meeting regulatory requirements and, if need be, developing new requirements, conducive to a safe, responsible and sustainable development. Gender issues should be considered, where appropriate.

NMP.2010.1.3-1 Reference methods for managing the risk of engineered nanoparticles

Technical content/scope: The development of new nanotechnology-based products needs to be complemented with a scientifically valid identification of the potential hazards from nanoparticles to human health and to the environment, together with the monitoring and reduction of the risk that these new technologies pose. Current knowledge is still incomplete and the established methods may be inappropriate for specific materials at the nano-dimension. Hence, future production system engineering need validated methodologies as basis for an appropriate integrated risk management. The expected projects should be related to validating, adapting and/or developing a reliable methodology for risk assessment and thorough overarching hazard identification for engineered nanoparticles and should address the following areas:

- a) Comparison and validation of current (and/or development including validation of new) test methods and test schemes, including in vitro and in silico methods, to detect adverse effects from nanoparticles to
 - i) human health including acute and chronic toxicity (oral, inhalation, dermal);
 - ii) to the environment; eco-toxicity tests, bioaccumulation, persistence, bioavailability and life cycle impacts onto all forms of biota.
- b) Relevant reference and/or certified reference materials
- c) Management of accidental risk including explosion and massive release
- d) Methods for performance assessment of hazard and exposure monitoring systems and on the field detection systems
- e) Methods for evaluation of risk reduction strategies and systems

Projects are expected to initiate and support standardisation of the proposed materials and methods, including methods for control of nanoparticle dispersion, labelling nanoparticles, and to work in parallel with similar projects globally.

In order to ensure industrial relevance and impact of the research effort, the active participation of industrial partners as well as third countries represents an added value to the activities and this will be reflected in the evaluation.

Funding scheme: Large-scale integrating collaborative projects.

Expected impact: i) Development of comprehensive understanding of the properties, interaction and fate of engineered nanomaterials in relation to human health and environment; (ii) support to policy and decision making concerning nanotechnology in respect to various stakeholders: public authorities, industry, researchers and citizens; (iii) support to good governance in nanotechnology; (iv) contribution to the future definition of appropriate measures, where needed; (v) support to pre and co-normative activities, such as with reference to the implementation of REACH; (vi) support to the safe, integrated and responsible approach as laid down in "Nanosciences and Nanotechnologies: An action plan for Europe".

NMP.2010.1.3-2 Modelling toxicity behaviour of engineered nanoparticles (Coordinated call with the USA)

Technical content/scope: The aim is to develop scientifically justified and technically viable methods for modelling human health and environmental effects of engineered nanoparticles, including their long term effects in the body or the environment.

The key research challenge is to establish techniques for modelling relationships between nanoparticle properties and toxicity. Modelling the interaction of nanoparticles with biological systems could also be considered. To this end, research should address the identification of physicochemical properties to be chosen for establishing groups of structurally similar particles, the characterisation and classification techniques, the test methods, and the relation of structural descriptors to toxicological targets. Projects should deliver the basis for an inventory of nanoparticles based on potential for exposure, categorising nanoparticles on the basis of physicochemical, structural and toxicological properties, and establishing relations between experimental (based on available data) and computational properties.

Maximum EU funding per project is 1 Million €. Establishment of collaboration with US partners responding to the US federal agencies' solicitation on "Environmental and biological fate, transport, and transformation of engineered nanomaterials"⁴ is mandatory and proposals not including

⁴ Information on the US federal agencies solicitation will be made available on the web-sites of the agencies concerned (EPA, NSF, NIESH, USDA and NIOSH).

collaboration with US partners are considered ineligible. Participation of other third countries besides the US is possible. The Commission will facilitate the clustering of projects financed in this call and other relevant ongoing or future projects in the field of generic toxicity modelling methods. Dissemination of project results to health and environmental authorities as well as to industry must be considered in the proposals.

Funding Scheme: Small or medium-scale focused research projects

Expected impact: Contributes to development of robust systems for evaluating the health and environmental impact of engineered nanomaterials, reducing the need for empirical testing (reduction of costs, reduced need for animal testing); in the long term, contribute to predictive models for designing and engineering nanomaterials that are safe by design.

II.2 Activity 4.2 Materials

Added value materials with higher knowledge content, new functionalities and improved performance are increasingly critical for industrial competitiveness and sustainable development; the materials themselves are the first step in increasing the value of products and their performance.

Research will focus on materials science and engineering, developing new knowledge-based multifunctional surfaces and materials with tailored properties and predictable performance, for new products and processes targeting a wide range of applications. This requires the knowledge of raw materials, the control of intrinsic properties, processing and production, taking into account potential impacts on health, safety and the environment throughout their entire life-cycle.

Emphasis will continue to be placed on new advanced materials and systems obtained using the potential of nanotechnologies and biotechnologies and/or 'learning from nature', in particular higher performance nano-materials (e.g. nano-composites), bio-materials, artificial materials with electromagnetic properties not found in nature, and hybrid materials, including design and control of their processing, properties and performance. A multidisciplinary approach will be fostered, involving chemistry, physics, engineering sciences, theoretical and computational modelling and increasingly the biological sciences.

Materials characterisation, design methods and simulation techniques are also essential to better understand and control materials phenomena, in particular the structure–property relationships at different scales, to improve materials assessment, reliability and durability, and enable industrial applications of materials by design. The integration of atomic, molecular to macro levels in chemical and materials technologies will be supported for developing new concepts, systems and processes. Issues related to the integration of materials and technologies, particularly for multi-sectoral applications, process development, scaling-up and industrialisation of high added value materials will also be addressed.

Materials are key for technological advances and are highly relevant to all the other Themes of the Seventh Framework Programme concerned with research related to the use of materials in their respective fields of application. Therefore, coordinated or joint calls may be launched and, where appropriate, focused international cooperation may be promoted.

II.2.1 Mastering nano-scale complexity in materials

The frontiers of materials research have been taken to the next level by the availability of technologies allowing the tailoring of material structure at the nanoscale and by the development of material systems made up of components with nanoscale dimensions. Materials based upon these concepts began to emerge with the study of low dimensional structures such as thin-films and interfaces and now encompass a wide range of material research areas, from nanostructured particles to nanostructured composites, coatings and membranes. The key objective is to tailor, at the nanoscale, novel material systems with radically new or enhanced properties and performance based upon our improved understanding of materials nanostructure.

- No topics foreseen in 2010 -

II.2.2 Knowledge-based smart materials with tailored properties

Smart materials, which provide a wide spectrum of enhanced functionalities and have the potential to replace whole devices, are having an enormous impact in today's modern world. Advances in smart materials have already started to find their way into industrial applications, but there are still immense possibilities to achieve improved functionality by further tailoring the material properties in many areas, from shape memory alloys and electroactive polymers to photochromic materials and tuneable dielectrics. The main objective is to design novel knowledge-based smart materials with tailored properties, releasing their potential for enhanced and innovative applications.

NMP.2010.2.2-1 Organic-inorganic hybrids for electronics and photonics

Technical content/scope: The electronics and photonics industry has been testing and/or developing both inorganic materials (semiconductors, metals and oxides) and organic materials with advanced properties and performance, for use in the new generation of devices. Integration of organic and inorganic materials into hybrids may allow innovative combination of useful organic- and inorganic-related characteristics at the scale of a single molecule or in building blocks at the nanoscale. New properties can also appear due to the role of the interfaces in hybrids. Research under the present topic should concentrate on developing innovative promising organic-inorganic hybrid materials with advanced properties for use as components, and/or allowing the application of more cost-efficient processing technologies, which can be useful for information and communication applications. Related processing technologies, combining existing methods to synthesize (hierarchically-structured) organic-inorganic materials or exploring new methods, should also be developed. Nano-engineered structures of the hybrid materials may also be considered, in order to exploit their functionality.

Funding scheme: Small or medium-scaled focused research projects.

Expected impact: (i) Innovative materials for future applications in information and communication technologies; for higher performance and/or low cost products; (ii) potential new, cost efficient production routes.

II.2.3 Novel biomaterials and bioinspired materials

Biomaterials are nowadays essential for improving human health, quality of life and environmental protection. Originally foreseen with the aim of minimising rejection by the host organism, they have now entered a new stage in which they can be designed with bioactive properties, exchanging stimuli with the surrounding tissue and inducing specific cellular reactions. Bioinspired materials, on the other hand, take advantage of the knowledge that nature has been optimising over millions of years. Man-made material solutions can now take inspiration from the most complex naturally-organised chemical and biological structures (e.g. from the nanoworld of proteins to macroscopic structures of bone, shell and enamel). The main objective should be to achieve radical innovations in state-of-the-art biomaterials and to design highly performing bioinspired materials learning from natural processes.

NMP.2010.2.3-1 Development of standard scaffolds for the rational design of bioactive materials for tissue regeneration

Technical content/scope: Rational design of smart biomaterials for tissue regeneration is critically dependent on the fundamental understanding of how cells or formed tissue work within engineered matrices. The next generation smart biomaterials should be designed based on the specific material properties (e.g. basic composition, surface chemistry, architecture) and on the function (e.g.

migration, proliferation or differentiation) of defined cellular systems (e.g. pluripotent stem cells, committed progenitors or their differentiated progeny). Gaining this knowledge is challenged by the limited availability of standardized and controlled in 'realistic' vitro models which provide systematic and reproducible bioactive environment to mimic the complexity of the natural materials in vivo. In order to be relevant for specific in vivo physio-pathological conditions, the in vitro model systems to be developed should mimic the natural 3D environment and thus rely on the combined interaction between cell types and biochemical factors concurrently active. Projects should account for well defined chemistry and physics of the scaffold, which, as an example, could be achieved by the use of biotechnology systems, which will also integrate sensing and control technologies. The validation of the novel bioactive scaffold should include an appropriate multiparametric analysis of all the concurrent in vivo factors involved, which are representative of the relevant cell and tissue interaction with the surrounding environment. Where appropriate, proposals must include a specific environment, health and safety research components to address the relevant aspects of characterisation, toxicology and eco-toxicology, and exposure assessment as part of the risk assessment of the biomaterials for tissue regeneration.

In order to ensure industrial relevance and impacts of the research efforts, the active participation of industrial partners represents an added value to the proposals and this will be reflected in the evaluation.

Funding scheme: Large scale integrating collaborative projects.

Expected impact: (i) Development of new, rational design criteria for advanced biomaterials/implants, whereby the specific nano/micro-scale properties, as well as the presentation of signalling molecules, are specifically targeted for a defined clinical use; (ii) Reduction of our reliance on complex and costly in vivo experiments to predict the performance of bioactive materials; (iii) Enhanced competitiveness of the biomaterials and biomedical industries in the EU.

II.2.4 Advances in chemical technologies and materials processing

Discoveries of new materials with tailored properties and advances in their processing are the rate-limiting steps in product development in many industrial sectors. Tomorrow's technology is in fact imposing increasingly stringent requirements on chemical technologies and materials processing. Materials chemistry has the potential to continue making substantial contributions to many fields, including modern plastics, paints, textiles and electronic materials, through the understanding of fundamental chemical interactions and processes. The key objective is to radically improve materials by increasing knowledge in materials chemistry and chemical processes, in particular at the nanoscale, e.g. in areas such as nanostructured catalysts and inorganic-organic hybrid systems, and to make progress in the field of environmentally friendly materials able to substitute currently harmful applications, and in the field of clean, flexible and efficient materials processing.

NMP.2010.2.4-1 New materials and/or membranes for catalytic reactors

Technical content/scope: The competitiveness and sustainability of the European chemical industry requires innovative efforts to reduce the number of steps in chemical processes and allow for the use of new raw materials. Advances in the development of nano-architected catalysts and other nano-structured materials have opened new possibilities to reach these objectives, by developing innovative solutions in order to realize one stage complex multi-step reactions, to selectively convert non-reactive raw materials such as short-chain (C1-C4) alkanes and to increase the productivity of the process by shifting the equilibrium through the in situ combination of reaction and separation.

Research on the integration of multidisciplinary competences, from preparation and characterization, combined with modelling, to materials and reactor design with the use of selective membranes and process engineering, is needed in order to enable the control of the

multiple factors determining reactivity and to explore the new process possibilities. The focus should be on highly innovative long-term research which opens new breakthrough concepts for the optimisation of chemical processes highly relevant for the chemical industry, by developing new materials and/or membranes for catalytic reactors. Where appropriate, proposals must address also specific environment, health and safety research and/or assessment. In order to ensure industrial relevance and impacts of the research efforts, the active participation of industrial partners represents an added value to the proposals and this will be reflected in the evaluation.

Funding scheme: Large scale integrating collaborative projects

Expected impact: (i) Reduction of the number of production steps; (ii) Opening of new possibilities for the use of advantageous raw materials currently rarely used; (iii) Reduction of the environmental impact, energy and raw materials consumption, and of the process risks.

II.2.5 Using engineering to develop high performance knowledge-based materials

The design of knowledge-based materials relying upon an accurate control of their properties can take advantage of highly performing modern engineering methods and powerful computer-based tools. The shift towards a higher knowledge-intensive industry demands radical innovation in materials for enhanced performance under increasingly challenging application conditions. Engineering tools, associated with modelling and simulation approaches often based on multi-scale methods, can help include the microscopic structure and properties into materials design, in order to construct more reliable high performance materials, based on an accurate prediction of their in-service behaviour and life-cycle analysis. The key objective is to use advanced engineering in order to design new material systems for specific highly-demanding applications, incorporating microstructural information with a view to enhancing performance. New materials can be addressed, such as nanostructured metals, alloys, inorganic and organic materials or nanoscale materials on supports which modulate the performance of the active materials and increase their functionality.

NMP.2010.2.5-1 Modelling of degradation and reliability of crystalline materials

Technical content/scope: Numerical modelling approaches based on an accurate description of the physical or chemical phenomena of relevance in advanced materials have become a major tool for predicting the degradation of different materials properties, and for predicting their lifetime. They have started to replace the more traditional empirical and semi-empirical methods of materials reliability and life-time assessment. Research should focus on advanced multi-scale modelling methods addressing both the degradation of material properties, e.g. in high temperature ageing, corrosion, irradiation, fatigue, wear etc., and the reliability of high performance inorganic crystalline materials. The modelling should be able to describe realistic situations under working conditions of industrial relevance, e.g. in construction and/or civil engineering, industrial components or products. The experimental validation of the developed models should be an integral part of the project. Lifetime or residual lifetime calculations may be included. Models based on purely stochastic and/or statistical approaches, which do not properly make use of the microstructural information, are excluded.

Funding scheme: Small or medium-scale focused research projects.

Expected impact: (i) Design of materials, products and equipment with superior properties and performance in service; (ii) Reduction in the consumption of raw materials, decrease of operating costs, etc.; (iii) Reduction of the number of accidents and enhanced safety.

II.2.6 Coordinated activities

The cross-sectoral nature of materials research and the widespread impact of its applications create obvious links with the other Themes under the Specific Programme 'Cooperation'. Cross-thematic areas will be addressed through joint calls published with other Themes, when it is possible to share the same objectives, or through coordinated calls addressing complementary objectives via a coordinated approach.

The increasingly important international dimension of industrial research requires a proactive approach to working with third countries in the field of materials research. International cooperation activities are, therefore, an important issue, in particular for those research areas where there is clear mutual benefit in terms of knowledge generation and market expansion. Specific actions may be foreseen, such as joint research activities that may be implemented via coordinated calls to address objectives of mutual interest. This may be of interest, in particular, in the case of countries active in materials research and those having signed an S&T cooperation agreement which includes the materials field. In addition, specific Support and Coordinated Actions can promote better links with international co-operation partner countries.

Topic "Materials, technologies and processes for sustainable automotive electrochemical storage applications" is implemented through the "Green cars" PPP initiative.

(see chapter II.5.3 and Annex 5 to this work programme)

II.3 Activity 4.3 New Production

The approach remains focused on the transformation of EU industry from a resource intensive to a sustainable knowledge-based industrial environment. This entails creating the appropriate conditions for continuous innovation (in industrial activities and production systems, including design, construction, devices, and services) and for developing generic production 'assets' (technologies, organisation, production facilities and human resources), while also meeting overall industrial safety and environmental requirements. Particular attention should be paid to promoting activities which support the adaptation and integration of SMEs to the new needs of the supply chain as well as to giving an impulse to the innovation in SMEs and the creation of high tech SMEs.

The research content in this activity is heavily influenced by the newly created Public-Private Partnership initiatives adopted within the framework of the European recovery package. Many topics which will be covered by the PPP initiatives are relevant to the scope and objectives of the New Production activity of the NMP Theme. Topics that do not fall entirely within the framework of the PPP initiatives remain under the New Production activity.

II.3.1 Development and validation of new industrial models and strategies

The key objective is the development of concepts for “knowledge-based factories as products”, which are capable of adapting themselves continuously to the requirements and tasks of changing market requirements or changing product- and production technologies. This involves the development and validation of new manufacturing and business models covering all aspects of product and process life-cycle, including but not limited to a full risk assessment at each critical stage of the life cycle, enhancing the European industries opportunities to compete and grow in the global market place. The research also focuses on the integration of reconfigurable technical systems and processes with factory level systems; integration of technical intelligence from sensors and actuators; and efficient systems networks based on standards. The scope includes discrete manufacturing and process industries, as well as construction and its associated industries.

NMP.2010.3.1-1 New industrial models for a sustainable and efficient production

Technical content/scope: The main objective is to develop holistic industrial models and concepts for new sustainable and more performing design and production systems/networks for new product/services, which are responsive to market and business changes. The new models must be tailored to innovative value propositions, conceived as solutions to unexpected and unexpressed needs to enable the creation of additional market potential. Moreover, they should take into consideration the economic factors which have an essential influence on the sustainability of a product/service, its production processes/systems/networks and its end-of-life recovery and recycling. In a volatile and rapidly changing global market, it is crucial to develop business models that dynamically integrate company economics taking into consideration local resources, such as commodities, energy, labour, etc. Such global governance models will enable European companies to offer their customers a broader choice of affordable sustainable and efficient products and processes with extended ranges of services.

The research should focus on:

- Development of new tools for analysing, modelling and matching the product's perceived quality features and customer usage modalities throughout the product life-cycle, to enable a sustainable approach to design of products tailored to customer needs;
- Development of new methodologies for intelligent product/process design, e.g. based on embedded devices, allowing innovative operation, use and service models; such kind of

products/service solutions should also improve the product sustainability by extending their life and by reducing their use of resources and the impact on the environment;

- Development and optimisation of production networks to address the dynamic challenges facing design of products/services, new processes and production systems/networks throughout a product life cycle.

Cooperation with IMS⁵ regions regarding economic and environmental aspects is foreseen, as appropriate.

Funding Scheme: Small or medium-scale focused research projects.

Expected Impact: A step-change in the performance of European industry, and in particular SMEs, can be achieved and can be characterised by a higher reactivity to customer needs by at least 20% in terms of real time economics and legislation monitoring and inclusion. Moreover extended product utilisation by at least 20 % through value-adding services is to be expected. A more economically and ecologically compatible products/services design and production systems/networks should also allow a more efficient use of material resources, via concurrent commodity management.

II.3.2 Adaptive Production Systems

The key objective is to develop production systems and elements for knowledge-based factories through holistic manufacturing engineering concepts. The systems should automatically and continuously adapt production resources and processes in an optimal way with respect to business and production objectives as well as market and technical conditions. Adaptive production systems integrate innovative processes, overcome existing process limitations and handle the transfer of manufacturing know-how into totally new manufacturing related methods. The research focus is on agility, adaptability and anticipation for flexible, small or even single batch oriented production; resource efficient, sustainable production processes; integration of affordable intelligent technologies and process control for optimal production; modular architecture concepts, adaptation of existing manufacturing equipment and resources and implementation of changes related to radically new technologies. The scope includes discrete manufacturing and process industries, supporting also the trend towards miniaturisation, as well as construction.

This area is implemented through the PPP initiatives "Factories of the Future" and "Energy-efficient buildings"

(see chapters II.5.1, II.5.2 and Annex 5 to this work programme)

II.3.3 Networked Production

The key objective is to support highly dynamic networked production through the development of tools and methods for co-operative and value-added operations for global production capability, including the design and innovation of high value-added products. Collaborative design, identification and verification of manufacturing requirements of all involved parties, determination and specification of processes as well as ICT systems are among the required key competencies. The research focus is on design innovation, network configuration, partner identification & partner development, networking, ramp-up, operation, optimisation and support for advanced decision-making. Synergies, coordination and collaboration with the ICT thematic priority will be sought, where appropriate.

⁵ For more information on IMS: <http://cordis.europa.eu/ims>. The European Community participates according to Article 108(2)(d) of the Financial Regulation.

This area is implemented through the PPP initiative "Factories of the Future"

(see chapter II.5.1 and Annex 5 to this work programme)

II.3.4 Rapid transfer and integration of new technologies into the design and operation of manufacturing processes

The key objective is the development of knowledge-based engineering capacities drawing on in-depth understanding of the behaviour of machines, processes and systems. This allows enterprises, in particular SMEs, to respond quickly to changes in a dynamic environment through integration of knowledge from all fields of manufacturing – from manufacturing networks up to the individual components of a production system. Knowledge-based manufacturing aims at innate transfer and protection of knowledge as well as the utilisation of a wide range of tools for integration of new technologies into the design and operation of new manufacturing processes as quickly and efficiently as possible. The research focus is on the development of advanced engineering concepts through knowledge sharing and knowledge distribution and through the integration of modelling, simulation and virtual production tools. The scope includes discrete manufacturing and process industries, as well as construction.

NMP.2010.3.4-1 Manufacturing systems for 3D-shaped, multilayered products based on flexible materials

Technical content/scope: Market demand for components and final products based on flexible light-weight materials is constantly increasing and related manufacturing processes and technologies are rapidly changing. Consumer trends in areas such as functional textiles, health, leisure and transportation are shifting from mass production goods to highly customised and personalised products. Also the new high-tech functional flexible materials are applied in a wide array of sectors such as high-strength light-weight structural components for construction, transport systems, energy systems, machine parts, personal protective equipment and medical devices.

Processing of such materials is available to some extent but an integrated and automated process chain has not yet been developed. The research focus is on the production equipment and the related manufacturing systems for the processing of such flexible materials. Fully automated and highly adaptable manufacturing systems need to be developed, which address the vertical integration of process chains. Material and FEM simulations should be used to predict the behaviour of the products manufactured from the highly automated integrated production systems. The multidisciplinary research teams should involve industrial stakeholders from machine tools, machine automation and processing of flexible materials, as well as the application sectors.

In order to ensure industrial relevance and impacts of the research efforts, the active participation of industrial partners represents an added value to the proposals and this will be reflected in the evaluation. Priority would be given to proposals which help integrate the entire process chain with the scope for adaptability to different materials.

Funding Scheme: Large-scale integrating collaborative projects.

Expected impact: The projects would offer turn key solutions for OEMs (Original Equipment Manufacturers) and also for SMEs to synchronise their manufacturing with the technological inputs from lean manufacturing systems. The technologies developed should also provide the OEMs with a competitive edge in the automated and robust manufacturing of higher volumes of customised end products for sectors such as automotive, medical applications, light weight structures etc.

II.3.5 Exploitation of the convergence of technologies

The key objective is to stimulate the creation of new industries by facilitating the design, engineering and manufacturing of the next generation of high value-added products, exploiting the opportunities, integration and convergence of, for example, micro-, nano-, bio-, info- and cognitive technologies. The research focus is on the application of basic research results for the development of new manufacturing processes for new science based products in order to create potentially disruptive products and production systems. Environmental technologies, adaptive and functional materials, cognition based control, intelligent mechatronic systems and process technologies are examples of possible application fields and there is a strong focus on micro and nanomanufacturing. Synergies, coordination and collaboration with the ICT and Bio thematic priorities will be sought, where appropriate.

This area is implemented through the PPP initiative "Factories of the Future"

(see chapter II.5.1 and Annex 5 to this work programme)

II.4 Activity 4.4 Integration

The integration of knowledge and technologies of the three areas of research above is essential in order to speed up the transformation of European industry and its economy, while adopting a safe, socially responsible and sustainable approach. The research will focus on new applications and novel, step-change solutions responding to major challenges, including the RTD needs identified by the different European Technology Platforms.

This research should enable and sustain the knowledge-based transformation of current industrial sectors and the development of new science-based sectors through the integration of new knowledge from nano-, materials-, and production technologies in sectoral and cross-sectoral applications. The RTD approaches and objectives applied by the partners should lead to results (products, processes, methods, etc.) and impacts which must observe the guidelines of the sustainable development paradigm, namely the public health, worker safety, environmental protection and the societal dimensions, including governance concerns (public awareness and acceptance). Furthermore this research work must constitute an opportunity for Europe to consolidate the optimal normalisation and standards needed.

Several cross-cutting dimensions could be considered while handling the vast array of sectors and applications and could further inspire the emergence of topics:

- **Transforming traditional industry**, which faces the challenge of low-cost competition. It should increase its productivity through new processes, high-added value products and new business models;
- **Fostering scale-intensive and specialised suppliers industry** through the adoption and integration of new advanced technologies thus enabling the improvement of its leadership in the global market;
- **Promoting Science-based Industry** which will play a key role in establishing a high-value European industry. It will need the integration of most of the advanced technologies dealt with in Nanotechnologies, Materials and Production activities, enabling the development of new, high value, products and services, processes and even leading to new industries.
- **Towards a sustainable supply industry** is another key objective in supporting product & productivity innovation, especially for sectors with a large environmental impact.

NMP.2010.4.0-1 Development of nanotechnology-based systems for detection, diagnosis and therapy for cancer

Technical content/scope: Cancer is currently the second leading cause of death in Europe and the disease takes a very high human toll. Application of nanotechnology systems bears high potential to provide more effective preventive, diagnostic and therapeutic options for cancer and to reduce the cost of healthcare. Diagnosis and therapy options should be addressed with an appropriately multidisciplinary approach. Activities for diagnostics could include for example the development of nano-systems for targeting appropriate cancer biomarkers linked to magnetic or optic labels or other contrast enhancing agents to enable detection by imaging or assay development using appropriately customised / functionalised nanostructures. Therapies based on nano-structures or nano-devices could involve intra-cellular delivery of non-classical drugs or macromolecules such as nucleic acids or antibodies. The construction of such systems would allow new types of effective drugs to reach patients with much lower side-effects. Where appropriate, the genomic and proteomic profile of individuals should be better taken into account in order to increase the efficiency of the treatment. The potential of the research to translate into clinical practice is very important although the clinical

testing phase on humans is not foreseen in the projects. Toxicity aspects of nanoparticles and nanosystems should be properly addressed, for instance by following the relevant OECD guidelines. Animal testing should be kept to the minimum needed and should be replaced by in-vitro tests wherever possible (3 R's: Reduction, Replacement, Refinement). Projects are expected to establish multi-disciplinary collaborations between e.g. academia, research organisations, pharmaceutical companies, manufacturers of medical equipment and hospitals.

In order to ensure strong industrial relevance and impact of the research effort, the active participation of industrial partners and clinicians is expected and this will be reflected in the evaluation. Activities other than research could be included, such as the analysis of regulatory aspects, education and training or pre-normative activities. Gender issues should be considered, where appropriate.

Funding Scheme: Large-scale integrating collaborative projects.

Expected impact: The research should stimulate the uptake of nanotechnology based approaches in cancer diagnosis and therapy. Overall, it should significantly improve diagnosis and therapy for cancer resulting in better healthcare for the citizens resulting from (i) more precise and efficient detection and diagnosis of cancer starting from its earliest stages (ii) new efficient targeted cancer therapies with much lower side effects; (iii). The developments should also improve the competitiveness of the European healthcare industry in world markets.

NMP.2010.4.0-2

Capacity building for the development of nanotech-based multi-parameter sensors

Technical content/scope: Nanosensors have potentially a huge range of applications, for example due to new functionalities, ultra sensitivity and a much decreased size, enabling the integration of nanosensors into many other devices. The miniaturisation potential offered by nanotechnology also facilitates sensor integration for multi-parameter detection. Further, nanofabrication and inspection tools require sensor- and actuator systems that can position objects with nanometre accuracy. Nevertheless, affordable mass production capacity (e.g. roll-to-roll) is a prerequisite for laying market foundations for a wide scale utilisation of nanosensors. The objective of the topic is hence to support capability building for the development and production of multi-parameter sensors based on nanotechnology (e.g., multilayer optical nanoparticles, doped thin films, plasmonic / luminescent nanosystems and / or innovative sensing methodologies based on higher dimensional analysis and / or pattern recognition, with major potential in a vast number of technology areas. This is a field of rapid development and very high interest for industry and with strong activities in other world regions. The proposed nano S&T-based approaches should enable to achieve the cost-effective detection, identification and measurement of multiple parameters in a single sensor (e.g. responding to optical, magnetic, chemical or biological stimuli). Such sensors should target one of the following three application areas: medical diagnostics, pollution monitoring or process monitoring. The deliverables are expected to include the sensor design, a technology demonstrator and a positive production capacity feasibility study (including economic assessment). The topic would be of interest for several ETP's, including Nanomedicine, Nano-electronics, Nanophotonics, Industrial Safety, etc.

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. Large scale integrating projects could include as appropriate activities such as specific modelling, specific education modules, pre- and co-normative activities and analysis of existing and required regulations.

Funding Scheme: Large-scale integrating collaborative projects.

Expected impact: The projects are expected to demonstrate that nanosensors provide a technically superior, cost effective alternative to conventional sensors and thus contribute to the realisation of the market potential of the existing research results⁶; to enable improved performance of applications in the fields of medical diagnostics, pollution monitoring and process monitoring, providing significant benefits to the citizens, environment and the European economy.

NMP.2010.4.0-3 High throughput technologies for the development of formulated products

Technical content/scope: Over the years there has been a clear trend to develop and market products with specific end-use properties rather than chemical compounds. This has led, in particular, to the development of a vast array of formulated healthcare and commodity products. Typically, formulated products are prepared and tested in an iterative manner by an expert formulator, which is often perceived as a time-consuming and inefficient approach. The term High Throughput Technologies (HTT) encompasses a wide range of advanced experimental and computational tools and techniques that could increase the productivity of such product development by orders of magnitude over traditional approaches. The aim is to accelerate innovative research for new materials and formulations, their properties and applications, tackling the development of high-throughput methodologies for the formulation, application and screening of, for instance, high viscous solutions, pastes and dispersions of nanoparticles. In addition, this can help to achieve a cleaner and safer manufacturing of formulated products and to better understand the relationship between their ingredients and their behaviour (e.g. structure-activity relationship). Integrated activities should range from the use of quantitative structure-activity relationship methods, the set-up of virtual libraries, and the definition of HTT methodologies for shaping formulation, to the implementation of the manufacturing process at pilot scale.

In order to ensure industrial relevance and impacts of the research efforts, the active participation of industrial partners represents an added value to the proposals and this will be reflected in the evaluation. Pilot scale production stage is needed to increase the exploitation potential. It is recommended to include a sustainability performance assessment of the elaborated products in order to evaluate their impact on sustainability.

Funding Scheme: Large-scale integrating collaborative projects.

Expected impact: Major improvements are expected both at product level through better optimisation of design and performance prediction and at production level with some clear benefits to productivity increase and time to market. It is also expected that the results will lead to development of standardised HTT synthesis protocols and to new knowledge in formulation engineering.

NMP.2010.4.0-4 A new generation of multi-functional fibre-based products produced by new and flexible manufacturing concepts

Technical content/scope: The objective is to integrate recent advances in the fields of nanotechnology, biotechnology, ICT, and sensor technology, for the next generation of sustainable paper and cardboard products which can have specific functionalities, allowing them to interact with their user or to report changes in their environment. High-capacity, light-weight paper batteries, "electronic papers" with printed components and embedded sensors, securities (e.g. bonds), new types of hygiene products with triggered release/absorption of liquids, are a few of the envisaged application areas. In addition, in packaging applications, new services might be required to provide information about the packaged product (such as services for anti-tampering and package tracking).

⁶ Although the 2005 NanoMarkets study predicts the nanosensor market to reach USD 17.2 billion by 2012, the commercialisation of nanosensors is still in its infancy.

Developments in several fields will enable industry sectors such as transport and packaging, pulp and paper production, hygiene articles and printing to provide higher added value and address rapidly changing customer-demands. However, a new generation of multi-functional fibre-based products requires new production technologies if production costs are to be maintained or decreased. Research should focus on:

- New functional components based on state-of-the-art advances in the fields of materials- and nano-sciences, ICT and bio-technology
- Printing or embedding techniques for adding new functional components to a paper or cardboard matrix
- Development of new highly adaptable manufacturing processes that allow for a recombination of the functional components being integrated into the product (e.g. battery, sensor and controlled fluid release)

Attention should also be paid to the life cycle analysis of the new products, including industrial safety aspects, as well as the optimization of waste-related issues.

SME dedicated Collaborative Projects are specifically designed to encourage SME participation in research and innovation representing the complete value added of the targeted sectors. 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.

In order to ensure an efficient implementation and maximum impact of SME-related activities, the following aspects will be evaluated under the criteria 'Implementation' and 'Impact':

- the leading role of SMEs with R&D capacities: the coordinator does not need to be an SME but the participating SMEs should have the decision making power in the project management and the output should be for the benefit of the participating SMEs and the targeted SME dominated industrial communities, and;
- level of SME involvement In addition to the evaluation criteria, please note that only proposals with an SME involvement of the order of 35% or more of the requested EC contribution will be selected.

Funding Scheme: SME-targeted collaborative projects.

Expected impact: Major improvements are expected in: (i) development of new high value added products meeting societal needs and with high potential of being marketed; (ii) acceleration of the industrial take-up of novel nanotechnology, biotechnology, ICT, and sensor technologies; (iii) novel manufacturing processes for small-scale production and integration of different functional components; and (iv) opening of virgin business areas able to generate economic growth and high quality jobs.

NMP.2010.4.0-5 Support to coordination activities of NMP related to European Technology Platforms – Coordinating actions

Several European Technology Platforms (ETP) are operating in technology fields and sectors relevant to the NMP theme. Although the ETPs have been capable of addressing the specific needs and challenges of their technology areas effectively, issues such as broader socio-economic challenges going beyond the technological needs can only be tackled through a cross-platform, collaborative approach.

Each proposal should include:

- a) creation of synergies between the ETPs, and where appropriate, with National and/or Regional Programmes and Platforms, ERA-NETs, activities on the Lead Market Initiative and Networks of Excellence;

b) identification of common elements between ETPs, and where appropriate, the initiatives mentioned in a); these elements concern: Joint Strategic Research Agendas (Research Road Maps), Joint Infrastructures, Joint Education Programmes, Joint commercial services;

c) development of a programme of commonly-defined activities on the elements mentioned above with the objective of meeting major challenges; e.g. clean and sustainable manufacturing, competitive and socially responsible commercialisation of nanotechnology, materials and "horizontal" technologies that will enable competitive and sustainable developments in a range of industrial sectors (ETPs).

d) development of strategies for measures concerning better regulation, standardisation, public procurement, fiscal incentives and other topics that will encourage the commercialisation of products and services relevant to the NMP theme.

Maximum EU funding is EUR 1million per proposal. Maximum duration is three years.

Funding scheme: Coordination and support actions (coordinating actions)

Expected impact: To further improve the implementation of the already developed Strategic Research Agendas (SRA) and Road Maps, as well as the other elements mentioned above, through relevant European and National public and private (industrial) research initiatives in the NMP field.

NMP.2010.4.0-6 Organisation of events related to the Presidencies of the European Union Supporting actions

Technical content/scope: An integral part of the NMP Theme's activity is to organise, together with successive EU presidencies, events of a strategic nature. The proposed Support Action(s) should contribute to new EuroNanoForum (ENF) and *Manufuture* conferences or other appropriate new events to be held in a Member State which will hold a forthcoming Presidency of the European Union, specifically Hungary and Poland (2011 Presidencies). In order to ensure high political and strategic relevance, the active involvement of the competent National Authority(ies) will be evaluated under criteria 'Quality' and 'Impact'. The proposed Support Action(s) should address topics that are of high relevance at the date of its taking place. An appropriate equilibrium should be present in the proposed action(s), with balanced presentation of various research and industrial elements and points of view. Participation of non-EU actors is possible. Outreach activities may be included such as e.g. a press programme and/or an event dedicated to schools. One Support Action can address the organisation of a dedicated NMP event; this event does not necessarily have to be organised in/by a country holding the EU Presidency, but may well be coordinated with an ENF edition.

Funding scheme: Coordination and Support Actions (supporting actions).

Expected impact: (i) Review of research, industrial and/or societal developments linked to the nanotechnology and/or the NMP areas, as appropriate; (ii) sharing of information and comparison of points of views; (iii) support to the activity of various stakeholders: natural scientists, social scientists, ethicists, researchers, industrialists, investors, museums and/or schools.

NMP.2010.4-0-7 ERA-NET on nanotechnologies, including nanotoxicology

Technical content/scope: The objective of the ERA-NET is to improve cooperation and coordination of national research programmes, including enhanced interaction with the Framework Programme and the NMP theme in particular. The aim is to promote the rapid take-up of results of nanoscience and nanotechnology research, by stimulating the creation of a new highly competitive industry, by facilitating the design, engineering and manufacturing of the next generation high value-added products within the Member and FP7 Associated States.

On the other hand, application of nanotechnology in industrial production poses new technical and

organisational challenges regarding management of risks, control of quality, protection of intellectual property, benchmarking of practices, etc. Of particular importance is the area of nanotoxicology, where national initiatives are reserving a significant share of their resources.

The ERA-NET should target establishing joint RTD programmes between the involved Member and FP7 Associated States, starting with nanotoxicology and risk management. Further synergies would be sought in response to existing European strategy and roadmap initiatives, as well as common National priorities.

Only ERA-NET eligible partners can participate. The minimum number of participants is set at three independent legal entities managing publicly funded national or regional programmes, each of which is established in a Member or Associated state. The Europe-wide character will be reflected in the evaluation.

The maximum EC funding requested per proposal must not exceed EUR 1.5 million.

Funding Scheme: Coordination and Support Actions (coordinating actions)

Expected impact: The activity should increase the synergies and coordination between national funding programmes, the Framework Programme, research organisations and industries, thus leveraging resources such as knowledge, capital and investment at European level. It should result in an increased and more rapid uptake of nanotechnology by European industries, while contributing towards a systematic and coordinated approach - in particular in the nanotoxicology field - towards assessment and management of potential risks.

NMP.2010.4-0-8 ERANET on Manufacturing

Technical content/scope: The objective of the ERA-NET is to improve cooperation and coordination of national and regional research programmes in the field of manufacturing, focussing on the development of new processes, and flexible, intelligent manufacturing systems, particularly dealing with everything related to machinery and machining processes. Building on the experience of the current MANUNET ERA-NET, the new ERA-NET on manufacturing will have a particular focus on increasing the participation of national authorities and programmes.

Coordination with other initiatives at European level, such as the "Factory of the future" Public-Private Partnership, and at national level should be properly addressed in order ensure complementarity and a proper involvement of industry, in particular SMEs.

Only ERA-NET eligible partners can participate. The minimum number of participants is set at three independent legal entities managing publicly funded national or regional programmes, each of which is established in a Member or Associated state. The Europe-wide character will be reflected in the evaluation.

The maximum EC funding requested per proposal must not exceed EUR 1.5 million.

Funding Scheme: Coordination and Support Actions (coordinating actions).

Expected impact: This activity is expected to set the basis for long-lasting cooperation in the field of manufacturing at national and regional level; to address in a coordinated way issues of common interests, and to capitalise the experience of joint calls and coordinated activities with a view to setting up a transnational European programme in the field.

NMP.2010.4-0-9 ERA-NET on Catalysis

Technical content/scope: It is essential for Europe to maintain a strong position in catalytic technologies in order to continue enjoying success in global markets. The objective of this

ERANET is to lead and improve European collaboration in innovation-focused applied research for the development of new chemical manufacturing technologies. The industrial sectors concerned include e.g. pharma, fine, specialty and basic chemicals, fuels, polymers, and materials. The focus shall be on applied catalysis, which is recognized as a central technology for sustainable chemistry, in continuation of the activity carried out within the current ERA-NET on applied catalysis but with an expanded scope towards reaction and process design. Due emphasis should be given to the integration of new catalytic technologies into whole process streams and value chains. At its heart this ERANET shall have best practice approaches to the creation and management of interdisciplinary applied research projects, strengthening links between industry and academia with the final aim of reducing the time from basic research to industrial innovation.

Only ERA-NET eligible partners can participate. The minimum number of participants is set at three independent legal entities managing publicly funded national or regional programmes, each of which is established in a Member or Associated state. The Europe-wide character will be reflected in the evaluation.

The maximum EC funding requested per proposal must not exceed EUR 1.5 million.

Funding Scheme: Coordination and Support Actions (coordinating actions).

Expected impact: This ERA-NET is expected to set the basis for long-lasting cooperation in the field of catalysis at national and regional level, to address in a coordinated way issues of common interests, to provide new dynamism to research, technological development and innovation in the field and to capitalise on the experience acquired with previous joint and coordinated activities. Beyond achieving its technical scope and position, this ERA-NET should contribute to placing catalysis in the context of the value-chain of the entire technology base of chemicals manufacturing.

II.5 Recovery Package: Public-Private Partnership (PPP) topics within NMP

The European Economic Recovery Plan adopted by the European Commission on 26 November 2008 and endorsed by the European Council on 11-12 December 2008 proposes actions to develop technologies for the manufacturing, construction and automotive sectors, which have recently seen demand plummet as a result of the crisis and which face significant challenges in the transition to the green economy. The Commission proposes to increase research financing through the RSFF instrument and to launch three Public-Private Partnerships (PPPs) which provide the required support to the three sectors:

- in the manufacturing sector: a 'Factories of the Future' initiative to help EU manufacturers across sectors, in particular SMEs, to adapt to global competitive pressures by increasing the technological base of EU manufacturing through the development and integration of the enabling technologies of the future, such as engineering technologies for adaptable machines and industrial processes, ICT, and advanced materials (EUR 1.2 billion);
- in the construction sector: an 'Energy-efficient Buildings' initiative to promote green technologies and the development of energy-efficient systems and materials in new and renovated buildings with a view to reducing radically their energy consumption and CO₂ emissions (EUR 1 billion);
- in the automotive sector: a 'Green Cars' initiative, involving research on a broad range of technologies and smart energy infrastructures essential to achieve a breakthrough in the use of renewable and non-polluting energy sources, safety and traffic fluidity (EUR 1 billion).

These initiatives are part of a comprehensive, integrated package to be implemented in cooperation between all the responsible services within the Commission, complemented by actions on the demand-side, such as public procurement, technical standards, and regulatory measures. This includes a further EUR 4 billion for non-research activities under the Green Cars Initiative.

The three PPPs are intended to prevent the crisis from deflecting attention from the EU's longer-term interests and the need to invest in its future. Research and Innovation are considered as strategic and "smart" investments to prepare the ground for the future of the EU economy which has to become a knowledge-based and low carbon economy, as stated in the Lisbon strategy. This is crucial for the EU to come out from the crisis stronger, more sustainable and more competitive.

The Commission is working in close collaboration with industrial representatives to develop longer-term research strategies for the three sectors, but to meet the need for a rapid start-up, the initiatives will be implemented in the first instance through a series of Cross-thematic Calls under the Work Programme 2010 between the relevant FP7 themes. Responsibility for these Cross-thematic Calls is as follows:

- The 'Factories of the Future' initiative involves financial support from the NMP⁷ and ICT⁸ Themes;
- The 'Energy-efficient Buildings' initiative involves financial support from the NMP, Energy, ICT and Environment Themes;
- The 'Green Cars' initiative involves financial support from the Transport, ICT, NMP, Energy, and Environment Themes.

⁷ Nanosciences, Nanotechnologies, Materials & New Production Technologies

⁸ Information and Communication Technologies

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 Fiche for the Joint Call on Sustainable automotive electrochemical storage in the Green Car PPP is included in Annex V. The Call Fiches for all the other topics can be found within the corresponding Work Programme chapter of each participating Theme. The topics in the FoF and EeB PPPs are organised in two Coordinated Calls with a common deadline. With the exception of the Joint Call on Sustainable automotive electrochemical storage, 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 WP 2010 Cross-thematic Calls are given in the following three sections V.1 to V.3. A table providing a global overview of the PPP topics in 2010 is given at the end of Annex V.

The RSFF will now include a front-loading measure as follows:

In line with Annex IV of this Work Programme, a total amount of EUR 220 million will be at the disposal of the EIB by July 2009, allowing an estimated amount of RSFF loan financing under the EC window in 2009 of EUR 1.1 billion.

II.5.1 "Factories of the Future" Public-Private Partnership (FoF) - Cross-thematic Coordinated Call between NMP and ICT

Manufacturing is still the driving force of the European Economy. Manufacturing activity in Europe represents approximately **21% of the EU GDP** and provides about **20% of all jobs** (more than 30 million) in **25 different industrial sectors**, largely dominated by SMEs. With each job on the factory floor generating approximately two other jobs in services, about 60 million people are additionally engaged in the related service areas. Therefore, manufacturing is of high importance to Europe, with a huge potential to generate wealth, jobs and a better quality of life. The long-term shift from a cost-based competitive advantage to one based on high added value requires that European manufacturing increases its technological base, building on the EU's excellent R&D in this domain, and develops a number of **enabling trans-sectoral production technologies**.

The *Factories of the Future* PPP Initiative aims at helping EU manufacturing enterprises, in particular SMEs, to adapt to global competitive pressures by developing the necessary enabling technologies to support EU manufacturing across a broad range of sectors. It will help European industry to meet the increasing global consumer demand for greener, more customised and higher quality products through the necessary transition to a demand-driven industry with lower waste generation and energy consumption.

The activities will concentrate on increasing the technological base of EU manufacturing through the development and integration of the enabling technologies of the future, such as engineering technologies for adaptable machines and industrial processes, ICT for manufacturing, and the novel industrial handling of advanced materials. The initiative will concentrate on industry-led R&D projects and will include demonstration activities, such as large-scale production-line demonstrators for validation and market applications. The partnership will work together to identify the R&D needs of manufacturing industry and in particular SMEs. In order to further ensure the PPP character of the initiative, a large part of the activities in the projects is expected to be performed by

industrial organisations themselves. This initiative, being by nature **cross-sectoral** and including efforts to address the **needs of SMEs**, aims to transform Europe into a dynamic and competitive knowledge-based economy by delivering:

- A new European model of production systems for the factories of the future (e.g. transformable factories, networking factories of excellence, learning factories) depending on different drivers such as high performance, high customisation, environmental friendliness, high efficiency of resources, human potential and knowledge creation.
- ICT-based production systems and high quality manufacturing technologies capable of optimising their performance with a high degree of autonomy and adaptability for a balanced combination of high throughput and high accuracy production.
- Sustainable manufacturing tools, methodologies and processes that have the capability of cost-efficiently shaping, handling and assembling products composed of complex and novel materials.

The indicative budget for the "Factories of the future" PPP initiative is EUR 95 million in 2010, of which EUR 60 million is from the NMP Theme, and EUR 35 million from the ICT Theme.

II.5.1.1 "Factories of the Future (FoF)" - Topics covered by the NMP Theme

FoF.NMP.2010-1 Plug-and-Produce components for adaptive control

Technical content/scope: The main objective is to develop active, self-optimising, portable plug-and-produce components for a new generation of adaptive production systems. These plug-and-produce components should hold the manufacturing process at optimal performance despite influence of disturbances, variations in plant performance or voluntary changes in the production. Research should also explore the potential of adaptive smart materials or combination of passive and active materials (mechatronic solutions and/or engineered materials) to increase the adaptability of production systems for changing conditions. The intelligent plug-and-produce systems can feature sensing and actuating structures, adaptive control and energy harvesting to allow a high accuracy in production systems under different conditions and to overcome the traditional limitations on dynamics versus precision.

Research should focus on self-sufficient intelligent plug-and-produce components with advanced sensing and actuating functionalities, e.g. based on smart materials. Such systems should easily implement and self-adapt their range of properties, depending on the changing process conditions. Regarding the use of smart materials, technical key points are the compensation of static and/or thermally induced dislocations, vibration damping and the decoupling of oscillations. Vibrations could be used for energy harvesting processes to transform kinetic energy into electric energy, to drive the intelligent system. Deliverables should include components and methods for intelligent, self-sufficient plug-and-produce systems. The system should be of an open architecture to facilitate any additions of new modules as needed for implementation in a new environment.

In order to ensure industrial relevance and impact of the research efforts, active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation.

The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be reflected in the evaluation.

Funding Scheme: Collaborative projects.

Expected impact: The new generations of adaptive production systems by means of active, self-optimising plug and produce components should lead to significantly improved dynamics, a higher

precision as well as a high level of reliability in the use of changing process conditions. This should result in higher productivity as well as higher product quality.

FoF.NMP.2010-2 Supply chain approaches for small series industrial production

Technical content/scope: Manufacturing systems for small series production will enable the transition from mass production to the personalised, customer-oriented and eco-efficient manufacturing needs of the future, requiring innovative interactions between design, materials, processes and ICT. A complete supply chain model addressing new challenges such as involving customers in design, which could include the creation and management of personalised data files, and on-demand manufacturing, requiring appropriate raw materials availability, highly flexible, fast response manufacturing techniques and final product acceptance criteria and procedures, needs to be developed. Typically, data capture, reverse engineering, design activities and manufacturing may take place in various geographical locations and need reliable data transfer capabilities.

The research should focus on advanced techniques for fast and reliable data capture and data management (ensuring confidentiality of data), flexible and multifunctional computer-aided component design systems, on-purpose planned raw material specification and supply as well as on fostering on ad-hoc logistics, legislative and organisational aspects in order to offer solutions in building sustainable supply chain approaches. Special attention will be required for final product quality management in the whole production chain. Particular emphasis may also be given on developing machines capable of processing specifically upgraded single or multi-materials parts.

The topic is aimed at projects driven by industry and service-to-industry companies, with significant demonstration elements of the complete manufacturing cycle distributed over the whole value chain. The overall objective of the topic is to involve the relevant industrial sectors, including OEMs (Original Equipment Manufacturers), design and service providers as well as material manufacturers.

In order to ensure industrial relevance and impact of the research efforts, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation. Regarding industrial SMEs, a strong participation, a significant role in the decision making structure of the project and clear benefits in the exploitation of the results would also add value to the project.

The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be reflected in the evaluation.

Funding Scheme: Collaborative projects.

Expected impact: First-time right flexible, energy and eco-efficient manufacturing systems will play a crucial role in maintaining the economic viability of manufacturing organisations within the EU. It is expected that the removal of technical barriers will open the way for wide-scale introduction and implementation of those systems. For example, Rapid Manufacturing technologies are expected to be in the market place for high value added products (replacing 5-15% of the conventional production techniques within the next 5-10 years), in a wide range of sectors. New supply chain approaches are particularly crucial for sectors in which citizens play an important role, such as health, consumer, automotive, electronics, but also high-end equipment.

FoF.NMP.2010-3 Intelligent, scalable, manufacturing platforms and equipment for components with micro- and nano-scale functional features

Technical content/scope: In order to be competitive in the global market, manufacturing industry needs to be cost-efficient and flexible in volume and product features, meeting at the same time quality and sustainability targets. The integration of micro- and nano-features in products and

production equipment shows high potential to enable the achievement of these targets. The aim is to deliver new reconfigurable, upscalable and multipurpose micro- and nano-manufacturing platforms and equipment that can facilitate cost efficient and competitive industrial-scale manufacturing of customised products. This will require the development of a new generation of modular, knowledge intensive, scalable and rapidly deployable systems, which should utilise the emerging technologies from micro- and nano-research and follow a flexible industrial production philosophy where production chains are easily downscalable in size or resolution, upscalable in volume and open to the introduction of new technologies, ensuring quality and reliability at low costs.

The research focus is on:

- New design and modelling tools for intelligent, integrated cross-domain design approaches to all aspects of the future manufacturing platforms (including design for manufacturing rules, prototyping, process & material characterisation, integrated process chains, assembly, packaging, metrology, testing, standardisation).
- New (in-line) control solutions and embedded sensor technologies for reconfigurable, modular micro- and nano-manufacturing systems, with potential link to factory level control systems (e.g. Manufacturing Executive System).
- Integrated new solutions for automatic handling of large volumes of very small parts or macro-components integrating small parts using high precision positioning and handling techniques.
- Novel solutions of nano-processing operations integrated within conventional mass production lines
- Modular and knowledge-based approaches, e.g. self-learning & auto-calibrating systems.
- Characterisation, quality control and yield management.

In order to ensure industrial relevance and impact of the research efforts, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation

The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be reflected in the evaluation.

The project consortia would benefit from the integration of players in the supply-chain of manufacturing systems and the integration of inter-sectoral technologies (micro- and nano-manufacturing, bio-, IT etc.).

Funding Scheme: Collaborative projects.

Expected Impacts: The approach must demonstrate its ability to:

- i) establish and to support a competitive European nano- and μ -manufacturing industry, creating favourable conditions for private investment and economic growth;
- ii) enable new factories, new equipments and new products with micro- and nano-scale functional features, integrating results from manufacturing of nano-materials & nano-surfaces and production technologies for μ -components;
- iii) upgrade existing factories by means of effective integration of nano-manufacturing processes; iv) reverse the trend of out-sourcing to low cost countries by allowing manufacturing on demand at the right time and place. The target is to strengthen Europe as a NMT-location for both equipment and production industry by creating the technology and infrastructure basis.

II.5.2 "Energy-efficient Buildings" - Public-Private Partnership (EeB) - Cross-thematic Coordinated Call between NMP, ICT, Energy and Environment

The construction industry accounts for more than 10 % of the EU's GDP and employs 32 million people in large, medium and small enterprises (direct and indirect employment). The construction sector is the highest contributor to the emission of Green House Gases with an average value estimated in most developed countries at close to 33%, knowing that around 40% of the total energy use corresponds to buildings, while their fossil-fuel heating represents a major share. Therefore, in the near future, the built environment in Europe needs to be designed, built and renovated with much higher energy efficiency. In order to achieve the objectives of the Energy Policy for Europe adopted early in 2007 and to contribute through Energy-efficient Buildings to the 20% reduction of energy consumption, 20% use of Renewable Energy Sources and 20% reduction of CO₂ emissions, a strong and continued effort in RTD and innovation in the short, medium and long term is needed.

The objective of the *Energy-efficient Buildings PPP Initiative* is to deliver, implement and optimise building and district concepts that have the technical, economic and societal potential to drastically reduce energy consumption and decrease CO₂ emissions, both in relation to new buildings and to the renovation of existing buildings. This new initiative should have a large payoff, as it will increase the market for energy-efficient, clean and affordable buildings. Research priority will be given to delivering new building materials and components for energy saving and energy generation, thermal energy storage systems, advance insulation systems, thermal distribution systems, lighting technologies, windows and glazing technologies, energy generation systems based on renewable sources, but also to reliable simulation and prediction tools, including assessment methods that integrate economical, social and environmental issues. To date, the construction industry has failed to effectively integrate key technologies into its operations in order to achieve sustainable, long-term competitiveness.

The aim of the activities is to identify, through the partnership with industry, the main RTD needs, and address a number of areas of clear industrial interest, such as tools, the building envelopes, systems and equipment, ICTs for energy efficiency, environmental technologies, social and behavioural aspects, standardisation and business models. Specific deliverables expected for new and refurbished buildings (including cultural heritage) are:

- Research for new design and manufacturing technologies, focussing on new building materials and components, thermal energy storage systems, advanced insulation systems, thermal distribution systems, lighting technologies, windows and glazing technologies, and assessment methods which include guidelines/methodologies for the eco-design and the Life Cycle Assessment of energy-efficient buildings.
- Research on ICT for energy efficiency in buildings, such as design and simulation tools, inter-operability/standards, building management systems, smart metering and user-awareness tools.
- Research on resource efficiency (waste and energy use) to identify best practices to help set standards and establish public policies for higher energy efficiency and reduced environmental impact.
- Research on the application of technological, design and organisational improvements at district-level with the aim of reducing the energy and resource consumption.
- Research-related activities on key demonstration topics concerning integration of innovative products and systems, grid issues and business models.

The indicative budget for the "Construction" PPP initiative is EUR 65 million in 2010, of which EUR 30 million is from the NMP Theme, EUR 15 million from the ICT Theme, EUR 15 million from the Energy Theme and EUR 5 million from the Environment Theme.

II.5.2.1 "Energy-efficient Buildings (EeB)" - Topics covered by the NMP Theme:

EeB.NMP.2010-1 **New nanotechnology-based high performance insulation systems for energy efficiency**

Technical content/scope: Insulating materials are used to keep the temperature constant in an enclosed space such as a house, either warmer or colder than the surroundings, and in doing so can protect the environment through the reduction of greenhouse gases. Nanotechnology offers high potential for enhanced insulation allowing thinner coatings or fillings to prevent heat loss or gain which would not be possible with conventional materials. The research shall focus on development of nanotechnology based insulation systems for enhanced thermal and improved mechanical properties while reducing overall costs making wide-scale commercial application feasible, including the renovation of existing installations. Examples of materials systems for achieving this are aerogels/aerogel composites and nanofoams or thin nanostructured insulators based on thermally resistant (composite) nanoparticles, which can be applied directly to a surface as a film, spray or paint. A further research objective is to combine the insulating effect with other functionalities, for example with photochromic, thermochromic, electrochromic for windows or flame retardant effects, self-cleaning, biocide or humidity control properties, for walls and roofs. The safety of proposed solution(s) must be ensured for the full product life cycle (production, use, disposal/recycling). Economic performance of the proposed solutions should be demonstrated by service-life costing analysis.

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.

The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be reflected in the evaluation.

Funding Scheme: Collaborative projects

Expected impact: (i) Reduce the cost of nanotechnology-based insulation systems and make their wide-scale commercial application feasible (ii) reduce the heat losses and gains through the building envelope for reduced energy consumption and increased indoor comfort; (iii) for windows which are the weakest part on the energy efficiency performance, a reduction in the U/value by more than 35% is expected compared with conventional ones. For glass covered building it would reduce the energy bill for heating by 40% and for cooling by 7%.

EeB.NMP.2010-2 **New technologies for energy efficiency at district level**

Technical content / scope: The construction sector can provide a significant contribution to the reduction of resources consumption and to a wider use of renewable resources. The main objective of the topic is to develop new technologies and methods to help reduce the energy consumption and environmental impact of buildings during their entire life-cycle (80% of energy consumption occurs during service-life) at district level, since this cannot be achieved only at building level.

The main focus is on new concepts, technologies, design tools and business models at district level for "intelligent buildings", able to significantly reduce or even completely meet their own energy consumption; improvement of the building energy performance (through cladding and ventilation technologies, sensors, actuators and pervasive computing systems, utilisation of embedded

renewable energy sources, etc.). Developments are also required at district level addressing new and improved materials and structures to improve the indoor environment as well as resource and climate, energy consumption conversion, storage capacities and energy carriers. Deliverables include the development, integration and demonstration, if possible at district level, of decision support systems and assessment tools of the above concepts e.g. for social housing, residential buildings, offices, and public buildings such as hospitals, schools and universities, railway- and underground-stations and airports.

In order to ensure industrial relevance and impact of the research efforts, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation.

The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be reflected in the evaluation.

Funding scheme: Collaborative projects.

Expected impact: The new technologies should contribute to a reduction of 50% in energy consumption compared to the 2005 values. The benefits for applying the new technologies at district level are expected to represent a significant reduction (around 20%) of the total costs compared to existing solutions. The return on investment for these additional costs should be preferably not more than 7 years, both in the case of new construction and retrofitting.

II.5.3 "European Green Cars" Public-Private Partnership (GC)

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)⁹.

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 activity '7.2.1. The Greening of Surface Transport' in its 2007 and 2008 Calls.

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 sub-theme (SST)]: 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.
- **Logistics and co-modality** combined with **intelligent transport system** technologies are essential to optimize 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.

⁹ "European industry – a sectoral overview, 2006 update, EC-DG ENTR

The 2010 Work Programme focuses on the second research avenue: electric and hybrid vehicles and their infrastructures. Three groups of topics covering collaborative research activities as well as coordination and support actions are included:

- Materials, technologies and processes for sustainable automotive electrochemical storage applications, implemented through a joint call with other themes.
- Research on electric and hybrid vehicles, implemented through the Sustainable Surface Transport (SST) sub-theme of the Transport theme.
- Information and Communication Technologies for the fully electric vehicle, implemented through the ICT theme.

The indicative budget for the "European Green Cars" PPP initiative is EUR 108 million in 2010, of which EUR 68 million is from the Transport Theme, EUR 10 million from the NMP Theme, EUR 20 million from the ICT Theme, EUR 5 million from the Environment Theme and EUR 5 million from the Energy Theme.

II.5.3.1 "European Green Cars" (GC) – Topic implemented via a Joint Call between the following Themes: NMP, Energy, Environment and Transport.

One of the crucial aspects of research needed for electric and hybrid vehicles related to electrochemical storage. It should concentrate on both: new low cost materials (nickel and cobalt oxides are expensive and their prices are exploding) and on safety problems related to thermal runaway. Research on these issues is multidisciplinary and must involve several themes to gather specialised knowledge and critical mass in a research field where step changes are needed. Another aspect that will be looked at is the issue of the recycling of batteries at the end of their life cycle and the development of technologies to maximise the recovery of materials, in particular for those of high added-value or presenting high environmental impacts.

The Joint Call is jointly organised by the Directorates NMP, Energy, Environment and Transport of DG RTD. The indicative budget of the NMP part for this "Green cars" PPP initiative is 10 million Euros in 2010, while the other Directorates each contribute 5 million Euros. The Community funding part of the indicative budget of the Call is thus 25 million Euros. The deadline is fixed on January 14, 2010 at 17.00 (Brussels local time). The Call fiche of this Joint call is found below and in Annex 5.

<p>GC.NMP.2010-1, GC.ENERGY.2010.10.2-2, GC.ENV.2010.3.1.3-3, GC.SST.2010.7-9</p>	<p>Materials, technologies and processes for sustainable automotive electrochemical storage applications</p>
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Contents/scope: Research projects are called for, addressing innovative materials and technologies for battery components, material architectures and systems for automotive electrochemical storage within a responsible, sustainable and environmental-friendly approach looking at the entire life cycle.

Projects for batteries and/or electrochemical capacitors are eligible. For batteries, research should focus on innovative developments for lithium-based energy storage technologies improving on safety and energy density. Alternatively, projects can be looking at completely different technologies, architectures and chemistries, such as open cells for higher energy densities.

For existing or near-to-market types of lithium-based batteries, projects dealing with the recycling, recovering and re-use of materials are eligible, as well as projects on the comprehension, modelling

and management of degradation drivers and processes with the aim to extend the calendar and operational life of the cells.

The environmental sustainability of each developed solution shall be assessed via life cycle assessment studies carried out according to the International Reference Life Cycle Data System (ILCD) Handbook¹⁰.

Cost, recyclability and safety issues should be prominently emphasized in all projects, as well as proof of concept in terms of product and/or process (not necessarily reaching the industrial scale but convincingly proving scalability towards industrial needs), thereby exploring their standardisation potential. The effect of bidirectional flow at charge stations should be taken in due account, as well as the potential for fast charging (at least 5C) without significant life reduction.

Participation from the manufacturing industrial sector is requested in each project. Aspects like characterisation, standardisation and synergies with other applications, availability of concerned materials, eco-design, manufacturing, can be covered.

At the same level of quality resulting from the evaluation by independent experts, priority for funding should be given to proposals that allow covering this topic as completely as possible.

Work on fuel cells is excluded since it is already covered in the related JTI, but synergies of storage chemistries and architectures with fuel cell vehicle applications showing performance beyond the call targets, can be covered.

Funding Scheme: Collaborative projects

Expected impact: Establishing the basis for a world level European automotive battery and electrochemical capacitors industry, with significant contributions to lead the market in the area of recycling¹¹. Fostering the constitution of interdisciplinary consortia. The expected impact has to be credibly motivated in terms of performance, cost, recyclability and life-cycle sustainability. Quantitative targets for lithium-based energy storage technologies include cost reduction down to a system level target value¹² of maximum 150€/kWh for mass production and improvement of safety and energy density up to at least 200 Wh/kg. For electrochemical capacitors the corresponding targets are respectively a cost reduction down to maximum of 10€/kW and a specific power of at least 25 kW/kg, with an energy density of at least 10 Wh/kg. Advanced chemistries should target energy densities of at least 300 Wh/kg.

¹⁰ http://lca.jrc.ec.europa.eu/EPLCA/Deliverables/ILCD_handbook.htm

¹¹ A Lead Market Initiative for Europe, <http://ec.europa.eu/enterprise/leadmarket/recycling.htm>.

¹² All targets are at end of life, cell level for mass produced elements unless otherwise specified.

III. CALLS FOR PROPOSALS

III.1 Calls for proposals NMP-2010

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies – LARGE 2010

- **Call identifier:** *FP7-NMP-2010-LARGE-4*
- **Date of publication**¹³: 30 July 2009
- **Deadline**¹⁴: For Large-scale integrating Collaborative Projects - first stage: 8 December 2009 at 17.00.00 (Brussels local time)
- **Indicative budget: EUR 105 million**¹⁵. The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call.
- **Topics called:**

Activity/ Area	Topics called	Funding Schemes
Health, Safety and Environmental Impacts	NMP.2010.1.3-1 Reference methods for managing the risk of engineered nanoparticles	<i>Large-scale integrating Collaborative Projects</i>
Novel biomaterials and bioinspired materials	NMP.2010.2.3-1 Development of standard scaffolds for the rational design of bioactive materials for tissue regeneration	
Advances in chemical technologies and materials processing	NMP.2010.2.4-1 New materials and/or membranes for catalytic reactors	
Rapid transfer and integration of new technologies into the design and operation of manufacturing processes	NMP.2010.3.4-1 Manufacturing systems for 3D-shaped, multilayered products based on flexible materials	
Integration of technologies for industrial applications	NMP.2010.4.0-1 Development of nanotechnology-based systems for detection, diagnosis and therapy for cancer	
	NMP.2010.4.0-2 Capacity building for the development of nanotech-based multi-parameter sensors	
	NMP.2010.4.0-3 High throughput technologies for the development of formulated products	

¹³ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

¹⁴ The Director-General responsible may delay this deadline by up to two months.

¹⁵ Under the condition that the preliminary draft budget for 2010 is adopted without modifications by the budgetary authority.

• **Eligibility conditions:**

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

For large scale integrating Collaborative Projects the minimum conditions to participate are: at least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC.

In addition to the general eligibility criteria, which are given in Annex 2 of the work programme, for large scale integrating projects **the minimum EC funding requested must be greater than EUR 4 million**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

The eligibility criteria apply to both first and second stage proposals. At stage 2, only information provided in Part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

• **Evaluation procedure:**

For Large scale integrating Collaborative Projects the evaluation shall follow a two-stage procedure. The first stage proposal, of a maximum of 10 pages (A4 pages; font size 11 points; top, bottom, left right margins: 15mm) should focus on the S&T content and on clear identification of the intended results, their intended use and the expected impact (economic, social, environmental, etc.) and 2 additional pages to describe the consortium and the estimated financial resources involved. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the EPSS. The Commission will instruct the experts to disregard any pages exceeding these limits. Proposals will be evaluated on the basis of two evaluation criteria, i.e.: *scientific quality and expected impact*. Stage 1 proposals will be evaluated remotely. Stage 1 proposals shall be submitted at the closure date mentioned above. Coordinators of retained proposals in stage 1 ('go' proposals) will be invited to submit a complete proposal that will be then evaluated against the entire set of evaluation criteria. The closure date of the second submission will be specified in the invitation to submit the complete proposal. The indicative closure date is: **18 May 2010**. Experts will carry out the individual evaluation of proposals remotely.

For this call, implemented via a two stage procedure, the following criteria and thresholds are applied:

- **Evaluation criteria and thresholds for stage 1 proposals:**

Stage 1 proposals are evaluated on the basis of the following two criteria: **S/T quality and Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

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

- **Evaluation criteria and thresholds for stage 2 proposals:**

Stage 2 proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

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

In order to ensure industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation.

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.

- **Indicative timetable:**

Evaluation Stage 1 proposals: January 2010; Evaluation stage 2 proposals: June 2010. Evaluation results: estimated to be available within two months after the call closure date. A reserve list of projects might be established.

- **Consortia agreements:**

Participants are required to conclude a consortium agreement.

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

- **Use of flat rates for subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website:

http://cordis.europa.eu/fp7/find-doc_en.html under 'Guidance documents/Flat rates for daily allowances'.

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies – SMALL 2010

- **Call identifier:** *FP7-NMP-2010-SMALL-4*
- **Date of publication**¹⁶: 30 July 2009
- **Deadline**¹⁷: For *Small or medium-scale focused research projects* - first stage: 8 December 2009 at 17.00.00 (Brussels local time)
- **Indicative budget: EUR 50 million**¹⁸. The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call.
- **Topics called:**

Activity/ Area	Topics called	Funding Schemes
Nanotechnologies and converging technologies	NMP.2010.1.2-2 Substitution of materials or components utilising "green nanotechnology"	<i>Small or medium-scale focused research projects</i>
	NMP.2010.1.2-3 Thermoelectric energy (TE) converters based on nanotechnology	
Knowledge-based smart materials with tailored properties	NMP.2010-2.2-1 Organic-inorganic hybrids for electronics and photonics	
Using engineering to develop high performance knowledge-based materials	NMP.2010.2.5-1 Modelling of degradation and reliability of crystalline materials	
Development and validation of new industrial models and strategies	NMP.2010.3.1-1 New industrial models for a sustainable and efficient production	

- **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. .

For small or medium scale focused research projects the minimum conditions to participate are: at least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC.

In addition to the general eligibility criteria, which are given in Annex 2 of the work programme, for Small or medium-scale focused research projects, **the maximum EC funding requested must not exceed EUR 4 million**. 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.

¹⁶ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

¹⁷ The Director-General responsible may delay this deadline by up to two months.

¹⁸ Under the condition that the preliminary draft budget for 2010 is adopted without modifications by the budgetary authority.

The eligibility criteria apply to both first and second stage proposals. At stage 2, only information provided in Part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Evaluation procedure:**

For Small or medium-scale focused research projects the evaluation shall follow a two-stage procedure. The first stage proposal, of a maximum of 10 pages (A4 pages; font size 11 points; top, bottom, left right margins: 15mm) should focus on the S&T content and on clear identification of the intended results, their intended use and the expected impact (economic, social, environmental, etc.) and 2 additional pages to describe the consortium and the estimated financial resources involved. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the EPSS. The Commission will instruct the experts to disregard any pages exceeding these limits. Proposals will be evaluated on the basis of two evaluation criteria, i.e.: *scientific quality and expected impact*. Stage 1 proposals will be evaluated remotely. Stage 1 proposals shall be submitted at the closure date mentioned above. Coordinators of retained proposals in stage 1 ('go' proposals) will be invited to submit a complete proposal that will be then evaluated against the entire set of evaluation criteria. The closure date of the second submission will be specified in the invitation to submit the complete proposal. The indicative closure date is: **18 May 2010**. Experts will carry out the individual evaluation of proposals remotely.

For this call, implemented via a two stage procedure, the following criteria and thresholds are applied:

- **Evaluation criteria and thresholds for stage 1 proposals:**

Stage 1 proposals are evaluated on the basis of the following two criteria: **S/T quality and Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

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

- **Evaluation criteria and thresholds for stage 2 proposals:**

Stage 2 proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

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

See also Annex 2: Eligibility and evaluation criteria for proposals.

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.

- **Indicative evaluation and contractual timetable:** Evaluation Stage 1 proposals: January 2010; Evaluation stage 2 proposals: June 2010. Evaluation results: estimated to be available within two months after the call closure date. A reserve list of projects might be established.
- **Consortia agreements:** Participants are required to conclude a consortium agreement.
- **Forms of grant and maximum reimbursement rates** for projects funded through the Cooperation work programme are given in Annex 3 of this work programme.
- **Use of flat rates for subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website:

http://cordis.europa.eu/fp7/find-doc_en.html under 'Guidance documents/Flat rates for daily allowances'.

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies - SMEs

- **Call identifier:** *FP7-NMP-2010-SME-4*
- **Date of publication**¹⁹: 30 July 2009
- **Deadline**²⁰: For SME-targeted Collaborative Projects - first stage: 8 December 2009 at 17.00.00 (Brussels local time)
- **Indicative budget: EUR 20 million**²¹. The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call.
- **Topics called:**

Activity/ Area	Topics called	Funding Schemes
Nanotechnologies and converging technologies	NMP.2010.1.2-1 Novel tools integrating individual techniques for real time nanomaterials characterisation - SME	SME-targeted Collaborative Projects
Integration of technologies for industrial applications	NMP.2010.4.0-4 A new generation of multi-functional fibre-based products produced by new and flexible manufacturing concepts – SME -	

- **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.

For SME targeted Collaborative Projects the minimum conditions to participate are: at least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC. For SME targeted projects **no upper or lower limits** in EC contribution are applied. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project.

The eligibility criteria apply to both first and second stage proposals. At stage 2, only information provided in Part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Evaluation procedure:**

For SME targeted projects the evaluation shall follow a two-stage procedure. The first stage proposal, of a maximum of 10 pages (A4 pages; font size 11 points; top, bottom, left right margins: 15mm) should focus on the S&T content and on clear identification of the intended results, their intended use and the expected impact (economic, social, environmental, etc.) and 2 additional pages to describe the consortium and the estimated financial resources involved. Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the EPSS. The Commission will instruct the experts to

¹⁹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

²⁰ The Director-General responsible may delay this deadline by up to two months.

²¹ Under the condition that the preliminary draft budget for 2010 is adopted without modifications by the budgetary authority.

disregard any pages exceeding these limits. Proposals will be evaluated on the basis of two evaluation criteria, i.e.: *scientific quality and expected impact*. Stage 1 proposals will be evaluated remotely. Stage 1 proposals shall be submitted at the closure date mentioned above. Coordinators of retained proposals in stage 1 ('go' proposals) will be invited to submit a complete proposal that will be then evaluated against the entire set of evaluation criteria. The closure date of the second submission will be specified in the invitation to submit the complete proposal. The indicative closure date is: **18 May 2010**. Experts will carry out the individual evaluation of proposals remotely.

For this call, implemented via a two stage procedure, the following criteria and thresholds are applied:

- Evaluation criteria and thresholds for stage 1 proposals:

In order to ensure an efficient implementation and maximum impact of SME-related activities, the following aspects will be evaluated under the criteria 'Implementation' and 'Impact':

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

- level of SME involvement. Please take note of the additional selection criterion below.

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.

For this call, implemented via a two stage procedure, the following criteria and thresholds are applied:

Stage 1 proposals are evaluated on the basis of the following two criteria: **S/T quality and Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

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

- Evaluation criteria and thresholds for stage 2 proposals:

Stage 2 proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

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

See also Annex 2: Eligibility and evaluation criteria for proposals

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.

- **Additional selection criteria**

SME-targeted Collaborative Projects will only be selected on the condition that the SME involvement is of the order of 35% or more of the requested EC contribution.

- **Indicative evaluation and contractual timetable:**

Evaluation Stage 1 proposals: January 2010; Evaluation stage 2 proposals: June 2010. Evaluation results: estimated to be available within two months after the call closure date. A reserve list of projects might be established.

- **Consortia agreements:** Participants are required to conclude a consortium agreement.
- **Forms of grant and maximum reimbursement rates** for projects funded through the Cooperation work programme are given in Annex 3.

- **Use of flat rates for subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website:

http://cordis.europa.eu/fp7/find-doc_en.html under 'Guidance documents/Flat rates for daily allowances'.

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies – CSAs

- **Call identifier:** *FP7-NMP-2010-CSA-4*
- **Date of publication**²²: 30 July 2009
- **Deadline**²³: For Coordination and Support Actions: 2 February 2010 at 17.00.00 (Brussels local time)
- **Indicative budget: EUR 6.5 million**²⁴. The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call.
- **Topics called:**

Activity/ Area	Topics called	Funding Schemes
Nanosciences and converging sciences	NMP.2010.1.1-1 Support to dialogue and engagement for responsible social acceptance of nanotechnology – coordinating actions	<i>Coordination and support actions</i>
Integration of technologies for industrial applications	NMP.2010.4.0-5 Support to coordination activities of NMP related European Technology Platforms –coordinating actions	
	NMP.2010.4.0-6 Organisation of events related to the Presidencies of the European Union – supporting actions	

- **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.

- Coordination and support actions - **coordinating actions**: at least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC;
- Coordination and support actions – **supporting actions**: at least 1 independent legal entity.

The following topics have specific eligibility criteria:

- **NMP.2010.1.1-1 Support to dialogue and engagement for responsible social acceptance of nanotechnology – coordinating actions**: the maximum EC funding requested per proposal must not exceed EUR 800.000;
- **NMP.2010.4.0-5 Support to coordination activities of NMP related European Technology Platforms –coordinating actions**: the maximum EC funding requested per proposal must not exceed € 1 million;

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.

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,

²² The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

²³ The Director-General responsible may delay this deadline by up to two months.

²⁴ Under the condition that the preliminary draft budget for 2010 is adopted without modifications by the budgetary authority.

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.

- **Evaluation procedure:**

For Coordination and Support Actions the evaluation shall follow a single stage procedure. See Annex 2: Eligibility and evaluation criteria for proposals.

The following topics have specific evaluation criteria:

- **NMP.2010.4.0-6 Organisation of events related to the Presidencies of the European Union – supporting actions:** in order to ensure high political and strategic relevance, the active involvement of the competent National Authority(ies) will be evaluated under criteria 'Quality' and 'Impact'.

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: March 2010. Evaluation results: estimated to be available within two months after the call closure date. A reserve list of projects might be established.
- **Consortia agreements:** Participants are encouraged but not required to conclude a consortium agreement.
- **Forms of grant and maximum reimbursement rates** for projects funded through the Cooperation work programme are given in Annex 3 of this work programme.
- **Use of flat rates for subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website:

http://cordis.europa.eu/fp7/find-doc_en.html under 'Guidance documents/Flat rates for daily allowances'.

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies – Coordinated call EU-USA 2010

- **Call identifier:** *FP7-NMP-2010-EU-USA*
- **Date of publication:**²⁵ 30 July 2009
Deadline²⁶: For Collaborative Projects - Small or medium-scale focused research projects – 30 November 2009 at 17.00.00 (Brussels local time).
- **Indicative budget: EUR 6 Million**²⁷ by EC- NMP Theme. The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call. The following US funding agencies: Environmental Protection Agency (EPA); National Science Foundation (NSF), National Institute for Occupational Safety and Health (NIOSH), National Institute of Environmental Health Sciences (NIEHS) and United States Department of Agriculture (USDA) are expected to make funding available for the US projects.
- **Topic called:**

Activity/Area	Topics	Funding Scheme
Health, Safety and Environmental impacts	NMP.2010.1.3-2 Modelling toxicity behaviour of engineered nanoparticles	Small or medium-scale focused research projects

- **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.

In line with the Rules for Participation, the minimum conditions to participate are: at least three independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC.

Proposals which do not include coordination with an US project will be considered ineligible. Therefore, the EC project proposals must include detailed explanations about the proposal to be financed by the US funding agencies (EPA, NSF, NIOSH, NIEHS, USDA). Proposals will only be evaluated on the condition that the proposal related to their coordinated US project(s) has also been presented for funding to the US funding agencies concerned.

For each Small or medium scale focused research project, the maximum EC funding requested must not exceed **EUR 1 million**. 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. Proposals must be submitted by using the European Commission Electronic Proposal Submission Service (EPSS) available on CORDIS at www.cordis.europa.eu.

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.

²⁵ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

²⁶ The Director-General responsible may delay this deadline by up to two months.

²⁷ Under the condition that the preliminary draft budget for 2010 is adopted without modifications by the budgetary authority.

- **Evaluation procedure**

For this call, the evaluation shall follow a single-stage procedure. The proposals will be evaluated by a panel which may also include American experts.

- **Evaluation criteria and thresholds**

The evaluation criteria and sub-criteria to be applied to this coordinated call are given in Annex 2 of this work programme.

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

In order to ensure a more genuine EU-US cooperation, a balanced effort between the coordinated projects and research plan properly involving coordinated research activities between Europe and united States represent an added value to the activities and this will be reflected in the evaluation under the criteria 'Impact' and 'Implementation'.

In terms of reciprocity, non confidential abstracts of EC retained proposals will be made available to the US authorities.

See also Annex 2: Eligibility and evaluation criteria for proposals

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.

- **Additional selection criterion**

Proposals will only be selected on the condition that their coordinated US project(s) will be funded by the US responsible funding agencies.

- **Indicative evaluation and contractual timetable**

Evaluation: Beginning of February 2010; Evaluation results: estimated to be available within three months after the call closure date. A reserve list of projects might be established. Negotiations will be carried out in parallel by the EC and the US funding agencies in order to have a simultaneous start of the respective grant agreements.

- **Consortia and coordination agreements**

Projects are required to conclude a coordination agreement with the participants in the coordinated project funded by the US funding agencies.

- **Use of flat rates for subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website: http://cordis.europa.eu/fp7/find-doc_en.html under 'Guidance documents/Flat rates for daily allowances'.

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies – Coordinated call EU-Mexico 2010

- **Call identifier:** *FP7-NMP-2010-EU-Mexico*
- **Date of publication:**²⁸ 30 July 2009
Deadline²⁹: For Collaborative Projects - Small or medium-scale focused research projects– 15 December 2009 at 17.00.00 (Brussels local time).
- **Indicative budget: EUR 6 Million**³⁰ by EC- NMP Theme. The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call. A budget equivalent to EUR 5 million - is made available by CONACYT – the Mexican National Council on Science and Technology.
- **Topic called:**

Activity/Area	Topics	Funding Scheme
<i>Nanotechnologies and converging technologies</i>	NMP.2010.1.2-4 Adding Value to mining at the Nanostructure level	<i>Small or medium-scale focused research projects</i>

- **Eligibility conditions:**

The coordinated call on the topic above is launched by the EC (this call) and the Mexican National Council on Science and Technology according to each respective rules.

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.

Each proposal must describe in detail the work to be carried out by EU participants and the work to be done by the Mexicans.

In line with the Rules for Participation, the minimum conditions to participate are: at least three independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC. At least three independent legal entities established in Mexico, one of which must be an enterprise, are requested from the Mexican side.

The maximum EC funding must not exceed EUR 2 million, including contributions to Latin American ICPC; Mexican participants will be funded by CONACYT. Proposals must be submitted by using the European Commission Electronic Proposal Submission Service (EPSS) available on CORDIS at www.cordis.europa.eu.

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.

²⁸ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

²⁹ The Director-General responsible may delay this deadline by up to two months.

³⁰ Under the condition that the preliminary draft budget for 2009 is adopted without modifications by the budgetary authority.

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**

For this call the evaluation shall follow a single-stage evaluation procedure. The proposals will be evaluated by a panel including both European and Mexican experts.

- **Evaluation criteria and thresholds**

The evaluation criteria and sub-criteria to be applied to this coordinated call are given in Annex 2 of this work programme.

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of half-point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

A balanced effort between the European and Mexican participants as well as other Latin American participants represents an added value to the activities and this will be reflected in the evaluation under the criteria 'Impact' and 'Implementation'.

See also Annex 2: Eligibility and evaluation criteria for proposals

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.

- **Additional selection criterion**

In each project, the EU participants will be funded by the EC whilst the Mexican participants will be funded by CONACYT. Therefore, all participants in the same project are technically - not financially - joint and severally responsible for the execution of the project. Proposals will only be selected on the condition that the Mexican participants are also funded by CONACYT.

- **Indicative evaluation and contractual timetable**

Evaluation: Beginning of February 2010; Evaluation results: estimated to be available within three months after the call closure date. A reserve list of projects might be established.

- **Consortia agreements**

Participants are requested to conclude a consortium agreement.

- **Use of flat rates for subsistence costs:**

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website: http://cordis.europa.eu/fp7/find-doc_en.html under 'Guidance documents/Flat rates for daily allowances'.

III.2 Public-Private Partnerships

III.2.1 Public-Private Partnership "Factories of the Future" - Cross thematic cooperation between NMP and ICT

Call title: "Factories of the Future" - 2010

- Call identifier: FP7-2010-NMP-ICT-FoF
- Date of publication: 30 July 2009³¹
- Deadline: 3 November 2009³² at 17.00.00 (Brussels local time).
- Indicative budget^{33 34}: EUR 95 million from the 2010 budget of which:
 - EUR 60 million from Theme 4 – Nanosciences, Nanotechnologies, Materials & New Production Technologies
 - EUR 35 million from Theme 3 – Information and Communication Technologies (ICT)
- **Topics called:**

Each Theme will remain responsible for its own budget and for the implementation of the respective call topics. This includes drawing up ranking lists and subsequent negotiation and follow-up of the grant agreements resulting from proposals selected under the respective call topics.

Activity/ Area	Topics called	Funding Schemes	Budget
NMP – Nanosciences, nanotechnologies, Materials and new Production			
FoF.NMP.2010-1	Plug and Produce components for adaptive control	<i>Collaborative projects</i>	60
FoF.NMP.2010-2	Supply chain approaches for small series industrial production		
FoF.NMP.2010-3	Intelligent, scalable, manufacturing platforms and equipment for components with micro- and nano-scale functional features		
ICT – Information and Communication Technologies			
FoF.ICT.2010.10-1	Smart Factories: ICT for agile and environmentally friendly manufacturing – a), b), c) d) targeted outcomes	<i>Collaborative projects (IP, STREP)</i>	33.5

³¹ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

³² The Director-General responsible may delay this deadline by up to two months

³³ 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.

³⁴ Under the condition that the preliminary draft budget for 2010 is adopted without modification by the budgetary authority

FoF.ICT.2010.10-1	Smart Factories: ICT for agile and environmentally friendly manufacturing – e) targeted outcomes	<i>Coordination and support actions (CSA)</i>	1.5
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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: 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 MS or AC, 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.

• For topic FoF.ICT.2010.10-1, each proposal must indicate the type of funding scheme used (IP or STREP for Collaborative Projects, where applicable; CA or SA for Coordination and support actions). See Appendix 2 of 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.

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, Evaluation criteria for proposals and priority order for proposals with the same score³⁵.

³⁵ 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

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: December 2009. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of January/February 2010.

- **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 each 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.

- **Use of flat rates for subsistence costs:**

For topics FoF.NMP.2010-1, FoF.NMP.2010-2, FoF.NMP.2010-3 and in accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website: http://cordis.europa.eu/fp7/find-doc_en.html under 'Guidance documents/Flat rates for daily allowances'.

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.

III.2.2 Public-Private Partnership "Energy-efficient Buildings" - Cross thematic cooperation between NMP, ICT, ENERGY, ENVIRONMENT (including climate change)

Call title: "Energy-efficient Buildings" - 2010

- Call identifier: FP7-2010-NMP-ENV-ENERGY-ICT-EeB
- Date of publication: 30 July 2009³⁶
- Deadline: 3 November 2009³⁷ at 17.00.00 (Brussels local time).
- Indicative budget^{38 39}: EUR 65 million from the 2010 budget of which:
 - EUR 30 million from Theme 4 – Nanosciences, Nanotechnologies, Materials & New Production Technologies
 - EUR 15 million from Theme 3 – Information and Communication Technologies (ICT)
 - EUR 15 million from Theme 5 – Energy
 - EUR 5 million from Theme 6 – Environment (including Climate Change)

- **Topics called:**

Each Theme will remain responsible for its own budget and for the implementation of the respective call topics. This includes drawing up ranking lists and subsequent negotiation and follow-up of the grant agreements resulting from proposals selected under the respective call topics.

Activity/ Area	Topics called	Funding Schemes	Budget
NMP – Nanosciences, nanotechnologies, Materials and new Production			
EeB.NMP.2010-1	New nanotechnology-based high performance insulation systems for energy efficiency	<i>Collaborative projects</i>	30
EeB.NMP.2010-2	New technologies for energy efficiency at district level		
Environment (including Climate Change)			
EeB.ENV.2010-3.2.4-1	Compatible solutions for improving the energy efficiency of historic buildings in urban areas	<i>Collaborative projects</i> ⁴⁰	5
Energy			

³⁶ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

³⁷ The Director-General responsible may delay this deadline by up to two months

³⁸ 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.

³⁹ Under the condition that the preliminary draft budget for 2010 is adopted without modification by the budgetary authority

⁴⁰ Up to one project will be supported.

EeB.ENERGY.2010.8.1-2	Demonstration of Energy Efficiency through Retrofitting of Buildings	<i>Collaborative projects⁴¹</i>	15
ICT – Information and Communication Technologies			
EeB.ICT.2010.10-2	ICT for energy-efficient buildings and spaces of public use - a) targeted outcomes	<i>Collaborative projects (STREP only)</i>	14
EeB.ICT.2010.10-2	ICT for energy-efficient buildings and spaces of public use - b) targeted outcomes	<i>Coordination and support actions (CSA)</i>	1

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: 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 MS or AC, and no 2 of which are established in the same MS or AC;
- Coordination and support actions – **supporting actions**: at least 1 independent legal entity.

For topic EeB.ENV.2010.3.2.4-1, the requested Community contribution must not be greater than EUR 5 000 000.

For topic EeB-ICT-2010-10.2, each proposal must indicate the type of funding scheme used (IP or STREP for Collaborative Projects, where applicable; CA or SA for Coordination and support actions). See Appendix 2 of 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.

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:

⁴¹ Up to 4 projects will be supported.

	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 score⁴².

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: December 2009. It is expected that the grant agreement negotiations for the shortlisted proposals will start as of January/February 2010.

• **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 each 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.

For topic EeB.ENERGY.2010.8.1-2, the following applies:

- Successful proposals will be asked to follow a common monitoring data structure, using a common methodology, in order to feed the relevant Commission data bases (e.g. CONCERTO data base).
- The form of grant applied in area 8.1.2. 'Energy efficiency in Buildings' is based on additional energy efficiency measures in buildings. The grant will 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 demonstration part of the buildings.
- The scale of unit cost of Community financial contribution is fixed to EUR 100 /m² eligible costs and thus EUR 50 /m² Community contribution.
- The eligible costs per building used in the projects are fixed costs.
- The total of Community financial contribution based on scale of unit costs may not exceed EUR 6 million for one demonstration site.
- The evaluation of the proposals will also take into account the degree of excellence and innovation of the technology used and the most cost effective practices (Euros/efficiency

⁴² 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.

gain; Euros/CO₂ reduction, kWh/m²/year saved). For this reason, the above figures should be indicated in the proposal.

- **Use of flat rates for subsistence costs:**

For topics EeB.NMP.2010-1, EeB.NMP.2010-2, EeB.ENV.2010.3.2.4-1, EeB.ENERGY.2010.8.1-2 and in accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website: http://cordis.europa.eu/fp7/find-doc_en.html under 'Guidance documents/Flat rates for daily allowances'.

III.2.3 Public-Private Partnership "Green Cars": Cross-Thematic cooperation between NMP, ENERGY, ENVIRONMENT (including Climate Change), TRANSPORT (including Aeronautics)

Call title: Sustainable automotive electrochemical storage

Call identifier: FP7-2010-GC-ELECTROCHEMICAL-STORAGE

Date of publication: 30 July 2009⁴³

Deadline: 14 January 2010 at 17.00.00 (Brussels local time)⁴⁴.

Indicative budget ^{45,46}: EUR 25 million from the 2010 budget of which:

- EUR 10 million from Theme 4 – Nanosciences, nanotechnologies, materials and new production technologies (NMP)
- EUR 5 million from Theme 5 – Energy
- EUR 5 million from Theme 6 – Environment (including Climate Change)
- EUR 5 million from Theme 7 – Transport (including Aeronautics).

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

The topic on Sustainable Automotive Electrochemical Storage is evaluated and implemented jointly by the Themes 4, 5, 6, and 7. It is identical in each theme. When applying for this call please use one of the activity codes below. Each proposal must be submitted only once.

Activity/ Area	Topics called	Funding Schemes
GC.NMP.2010-1	Materials, technologies and processes for sustainable automotive electrochemical storage applications	Collaborative Project
GC.ENERGY.2010.10.2-2		
GC.ENV.2010.3.1.3-3		
GC.SST.2010.7-9		

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.

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

⁴³ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁴⁴ The Director-General responsible may delay this deadline by up to two months.

⁴⁵ 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.

⁴⁶ Under the condition that the preliminary draft budget for 2010 is adopted without modification by the budgetary authority.

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.

Under this topic, the requested Community contribution must not exceed EUR 4 million.

Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

Evaluation procedure

- For this call the evaluation shall follow a single-stage evaluation procedure.
- Proposals will not be evaluated anonymously.
- Proposals will be evaluated remotely with the consensus session being held in Brussels.
- The page limits that apply to proposals submitted under this call are given in the Guide for Applicants and in the proposal part B template available through the EPSS. The Commission will instruct the experts to disregard any pages in excess of these limits.
- At the Panel stage, proposals with equal overall scores will be prioritised according to 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.
- Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of 0.5 point scores. Successful proposals must pass the minimum thresholds as follows:

	Minimum threshold
S/T quality	3/5
Implementation	3/5
Impact	3/5
Overall threshold required	10/15

Particular requirements for participation, evaluation and implementation

The forms of grants and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.

Indicative Evaluation and contractual timetable

Evaluation: remote phase January 2010, consensus phase February 2010. Evaluation results: estimated to be available by April 2010. A single reserve list of projects might be established, for which the results are estimated to be available by the second semester of 2010.

Consortia agreements

Participants in Collaborative Projects are required to conclude a consortium agreement prior to grant agreement.

Use of flat rates for subsistence costs:

In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available at the following website: http://cordis.europa.eu/fp7/find-doc_en.html under 'Guidance documents/Flat rates for daily allowances'.

III.3 ERANET and ERANET Plus topics

The topics to be implemented via **ERANET** under Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies is included in the single ERANET coordinated call and are described in Annex 4. These topics are shown below:

Activity/ Area	Topics called
ERA-NET	NMP.2010.4.0-7 ERANET on nanotechnologies, including nanotoxicology
	NMP.2010.4.0-8 ERANET on Manufacturing
	NMP.2010.4.0-9 ERANET on Catalysis

IV OTHER ACTIONS AND PUBLIC PROCUREMENT IN 2010

IV.1 Other Actions⁴⁷

The funding of projects through the above schemes and the development of the programme will be supported by:

- the use of appointed **independent experts** for the evaluation of project proposals, as independent observers at these evaluations where appropriate, for the reviewing of running projects, and for focus groups (evaluation);

Funding scheme: CSA – expert contract

- **studies** into relevant future needs of industry and society, that is "top down" studies to be implemented through public procurement;

Funding scheme: CSA – public procurement

- the use of **external assistance** (by 'Project Technical Assistants') to enable, if necessary, detailed, prompt, pro-active, and scientifically competent following of the projects by the Commission (to be implemented through public procurement);

Funding scheme: CSA – public procurement

- where appropriate, **Calls for Tender for public procurements**. The Commission will issue such as specific studies or services required to achieve the programme objectives, particularly with regard to the monitoring and assessment of the programme and to the promotion and dissemination of results.

Funding scheme: CSA – public procurement

- **Dissemination actions:** dissemination of specific project results (apart from publication / promotion on CORDIS and as success stories) is an integral part within each project. However, specific dissemination activities are, in addition, also envisaged:

- supporting actions implemented via calls for proposals (for "bottom up" topics) or public procurement (for "top down" topics): promotion of synergies, clusters of results within a given area (conferences, video/broadcasting, publications, prizes and awards, exhibitions and generic brokerage events, etc.);

- publication on CORDIS: information to proposers, information on funded projects; presentation of project results.

Funding scheme: CSA – public procurement

- **Monitoring, evaluation, and impact assessment:** NMP will comply with the prevailing requirements for monitoring, evaluation, and impact assessment. This may involve studies and surveys (implemented through public procurement) as well as panels of nominated experts and "bottom up" inputs obtained through funded projects and Coordination and Supporting Actions. This will include the ex-post impact assessment of NMP activities under the 6th Framework Programme both at programme and project levels and studies of the longer term impact of Community funding of research in certain areas / disciplines / sectors. The impact assessment will comprise:

⁴⁷ In accordance with Articles 14, 17 and 27 of the Regulation No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

- the analysis of possible links with national activities in the context of ERA;
- the analysis of societal and industrial impact of technical change associated with the industrial transition.

Funding scheme: CSA – public procurement, expert contract

- **Promoting exploitation and innovation:** NMP will continue to fight the gap between the (generally high) level of scientific-technical success of its funded projects and the (often lower) level of actual implementation of these results (as necessary to lead to growth, competitiveness, sustainability, jobs). External assistance (the 'Exploitation Strategy and Innovation Consultants' service) will be used to identify and address possible obstacles to the future exploitation of the intended results (this service includes the 'Exploitation Strategy Seminars'). These initiatives are implemented through public procurement.

Funding scheme: These initiatives are implemented through CSA - public procurement.

- **Risk Sharing Finance Facility:** In addition to direct financial support to participants in RTD actions, the European Community will improve the/participants access to private sector finance by contributing financially to the 'Risk-Sharing Finance Facility' (RSFF) established by the European Investment Bank (EIB).

The European Community contribution to RSFF will be used by the Bank in accordance with eligibility criteria set out in the work programme 'Cooperation' (see details in Annex 4). RSFF support is not conditional on promoters securing grants resulting from Framework Programme calls for proposals, although the combination of grants and RSFF-supported financing from EIB is possible.

The use of the Community Contribution from the Specific Programme 'Cooperation' will be on a 'first come, first served' basis and will not be constrained by the proportional contribution of Themes.

- **Intelligent Manufacturing Systems Secretariat:** In The NMP programme will support the IMS secretariat for an amount of EUR 0.14 million in 2010.

Funding scheme: other actions

- **Support for the work of the Expert Advisory Group (EAG):** Studies, foresight-driven synthesis of RTD needs in the NMP areas, as inputs to the Directorate's policy making and WP preparation, for an amount of EUR 0.050 million in 2010.

Funding scheme: CSA – expert contract

IV.2 Public Procurement in 2010⁴⁸

(1) Specific contracts to be concluded under existing framework contracts

- **Project Technical Assistants (PTA)**

Subject: External assistance to enable detailed, prompt, pro-active, and scientifically competent follow-up by the Commission of NMP projects.

Contracts: Up to 20 specific contracts for a duration corresponding with the duration of the projects covered.

Budget: maximum EUR 1 500 000 in 2010.

- **Exploitation Strategy and Innovation Consultants (ESIC)**

Subject: External assistance to identify and address possible or actual obstacles to the future or imminent exploitation of the intended or already achieved results of projects (on-demand service; this includes the Exploitation Strategy Seminars service).

Contracts: 6 specific contracts (one every 2 months) with a duration of max. 6 months, possibly complemented by order forms.

Budget: maximum EUR 450.000 in 2010.

(2) New procurement procedures

- **Options for a European nanotechnology R&D strategy - a technometric and socio-econometric analysis**

Subject: Options for a European nanotechnology R&D strategy - a technometric and socio-econometric analysis

Contracts: 1 contract of 6 months

Timing: Upon approval of this work programme (third quarter of 2009⁴⁹)

Budget: EUR 100 000

- **Promotional Material to enhance marketing of Materials Research**

Subject: Production of approximately 10,000 boxes containing 4 or 5 objects showing some materials research progress over the last few years and their potential (together with a succinct explanation of why the materials behave like they do)

Contracts: 1 contract of 6 months

Timing: Upon approval of this work programme (third quarter of 2009⁵⁰)

Budget: EUR 60 000

⁴⁸ The funding scheme: Coordination and support actions - public procurement in accordance with Articles 14 (b) of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

⁴⁹ Under the condition that the preliminary draft budget for 2010 is adopted without modification by the budgetary authority.

⁵⁰ Under the condition that the preliminary draft budget for 2010 is adopted without modification by the budgetary authority.

V INDICATIVE BUDGETS**V.1 Indicative Budget (Million EUR): FOURTH calls 2010**

		2010*
4th calls	Large-scale integrating Collaborative projects	105
	Small or medium-scale focused research projects	50
	SME-targeted collaborative projects	20
	CSAs (Coordination and Support Actions)	6.50
	ERANET	4.50
	Coordinated call EU-Mexico	6
	Coordinated call EU-USA	6
	Sub-total (2010 topics)	198.00
Public-Private Partnerships (PPPs) calls	Factories of the Future	60
	Energy-efficient Buildings	30
	Green cars	10
	Sub-total (PPPs)	100
Other activities	- Evaluation and reviewer (1.80) - Calls for tenders (2.11) - Other actions (IMS secretariat; EAG related studies – 0.19)	4.10
General Activities (see Annex 4)	- Cordis (0.789) - Eureka/Research organisations (0.034) - Cost (3.211) - Strategic activities (0.115)	4.14
TOTAL		306.24

* Under the condition that the preliminary draft budget for 2010 is adopted without modifications by the budgetary authority.

**ERANET projects are implemented via a coordinated call as detailed in Annex 4.

The budget for these calls 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.

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 actions not implemented through calls for proposals may vary by up to 10% of the indicated budgets for these actions.

V.2 Indicative budget (Million EUR): THIRD calls published in 2009

		2009	2010	Total
	Joint call Biorefinery	7.000		7.000
	Large-scale integrating Collaborative Projects			
3rd calls		71.704	53.296	125.000
	Small or medium-scale focused research projects			
		45.000	35.000	80.000
	SME-targeted Collaborative Projects	15.000	10.000	25.000
	CSA (Coordination and Support Actions)	5.000		5.000
	Joint call Environment	5.000		5.000
	Coordinated call Russia	4.650		4.650
	Mapping research infrastructure call	0.350		0.350
	ERANET **	1.500		1.500
Other activities	- Evaluation (1.940)			
	- Calls for tenders (1.875)	3.815		
General Activities (see Annex 4)	- Cordis (1.336)			
	- Eureka/Research organisations (0.041)	5.144		
	- Cost (3.744)			
	-ERANET (0.023)			

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