WORK PROGRAMME 2008

COOPERATION

THEME 4

NANOSCIENCES, NANOTECHNOLOGIES, MATERIALS AND NEW PRODUCTION TECHNOLOGIES - NMP

(European Commission C(2007)5765 of 29 November 2007)

Cooperation Work Programme: NMP Theme

The work programme presented here provides for seven new calls for proposals to be published in late 2007 and a range of other activities for 2008.

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Objective

The principle 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 FP7 Themes.

I Context

I.1 Policy context

The core objective of Theme 4 "*Nanosciences, Nanotechnologies, Materials and new Production Technologies* – NMP" is to fund research, development, demonstration, and coordination projects that will effectively 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 such as climate change and resources scarcity. 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. Furthermore, it should be driven and supported by a competitive knowledge production capacity at the global level.

The NMP Theme pursues the overall objective of enhancing the competitiveness of European industry 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 competitiveness of more mature industries is also largely dependent on their capacity to integrate knowledge and new technologies.

I.2 Approach

The NMP Theme ensures continuity with previous programmes, but it has evolved on the basis of the acquired experience and of the challenges imposed by the needs of European industry.

Europe's position still needs to be strengthened in the research activities related to nanosciences, nanotechnologies, materials and production technologies within the highly competitive global context. The competitiveness of industry will largely depend on new knowledge and on new ways of integrating and exploiting existing and new knowledge. Europe can benefit from its recognised leadership in specific fields and particularly through bringing specialist disciplines together.

A key issue will be to integrate competitiveness, innovation and sustainability into the research activities covered by the Theme as well as initiatives capable of fostering the dialogue with society at large. In addition to taking into account the Strategic Research Agendas (SRAs) of the several European Technology Platforms associated with this Theme 4, and to contributing to the implementation of the Environmental Technologies Action Plan, research has to be complemented

by activities aimed at education and skills development addressing the more long-term research issues underlying many technology fields.

A key element of Theme 4 is the effective integration of nanotechnology, materials science, design and new production methods, so as to achieve and maximise impacts for industrial transformation and, at the same time, supporting sustainable production and consumption.

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 will be strongly focused on demonstrable added value in EU industry arising from a proper appreciation of the potential of nanotechnologies, materials and production technologies.

To this end Theme 4 is structured as follows:

a) Three thematic activities, Nanosciences and Nanotechnologies, Materials and new Production Technologies, each of which requires significant new RTD efforts to generate knowledge and integrate its different technologies for problem-solving approaches.

b) A fourth activity of "Integration" as such, which 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. Applications in all sectors of industrial activity and their areas of application may be supported, including materials sciences and technologies, efficient health, safety and environmental (HSE) evaluation, high performance manufacturing and process technologies, nanobiotechnology and nanoelectronics, instrumentation, etc.

In the **long term**, this Theme aims at capitalising on the enormous potential of nanosciences and nanotechnologies for the creation of a true knowledge-based industry and economy. Emphasis will be increasingly given to research helping to develop the S&T base in particular in nanosciences, nanomaterials and nanomanufacturing.

In the **medium term**, the focus is on a convergence of knowledge, technologies and skills drawn from different disciplines, exploiting application-driven scientific and technological synergies.

In both cases it will be essential to ensure the uptake of knowledge generated through effective dissemination and use of the results.

I.3 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 Theme 4.

Moreover, dedicated calls for collaborative projects targeted to SMEs are implemented in specific areas with the aim of reinforcing the scientific and technological base of SMEs and of validating innovative solutions. SME projects should be led by SMEs with R&D capacities and, obviously, include the participation of universities, research centres and other industries or industrial associations as appropriate. In each project, at least 35% of the EC contribution must be allocated to the participating SMEs.

I. 4 International Cooperation

The increasingly important *international dimension* of industrial research requires a well-coordinated approach to working with third countries and in international forums. International

cooperation activities will therefore be an important issue across the Theme, which is open to the participation of third countries where there is evident mutual benefit. Although all topics are open to international cooperation, some topics have been specifically highlighted as being research areas which are particularly well suited for international cooperation. For these topics, the inclusion of a relevant third country partner(s) could add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken. In addition, specific actions may include:

- activities with industrialised countries and those having signed an S&T cooperation agreement in the fields of NMP, that may be implemented via coordinated calls to address objectives of mutual interest;
- specific initiatives to promote the participation in the NMP Theme of emerging economies and developing countries (see Annex 1 – International Cooperation Partner Countries - ICPC). These initiatives may consist of 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 (SICAs[1]) supporting collaborative projects on topics of common interest. Initial contacts have been established with third countries such as China, India and Russia.
- the Intelligent Manufacturing Systems (IMS) scheme, which allows RTD cooperation between the member regions of the IMS agreement[2];
- 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.
- co-ordinated 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.

I.5 Coordination with National and regional activities

Specific actions to **coordinate programmes and joint activities** conducted at national and regional level will also be carried out through *ad hoc* schemes (with particular reference to ERANET and ERANET-*plus*) so as to promote convergence of research programmes and to reinforce critical mass. Coordination will also be encouraged to foster synergies within and between the emerging European Technology Platforms. In addition, industrial research will benefit from the coordination of activities in areas such as metrology, toxicology, standards and nomenclature, for example.

Actions to improve synergies between the research activities of Member States and Associated States, including COST and Eureka, are also envisaged.

I.6 Coordination with other Themes

The cross-sectoral nature of Theme 4 – NMP – means that obvious links also exist between NMP and the other Themes of the 7th Framework Programme under the Specific Programme "Cooperation", in particular Health, Food, Security, Space, ICT, Energy, Environment and

[1] For Collaborative Projects, 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.

[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.

Transport. Cross-thematic areas will be addressed, on the one hand, through **joint calls** published jointly with other Themes, thus ensuring that the same objectives are achieved and, on the other hand, through **coordinated calls** so as to address complementary objectives via a coordinated approach. Synergy with the Specific Programme "Capacities" of the 7th Framework Programme will be put forward. Details on joint or coordinated calls are given in Section IV *Implementation of calls 2008.*

I.7 Funding Schemes

Theme 4 will be implemented through the following funding schemes common to FP7:

- ***Collaborative projects***: Small or medium-scale focussed research projects and large scale integrating projects are implemented via separate calls. For the small or medium scale focussed research projects a ceiling of **maximum** EC funding requested exists and details can be found in the call fiches. Likewise, for large scale integrating projects a limit of **minimum** EC funding requested exists and details can be found in the call fiches. The financial resources mobilised within projects will be assessed against the real work to be carried out and, therefore, a wide range of project-sizes (within the limits given by the thresholds mentioned above) is expected. The SME-targeted research projects are also under the collaborative research projects.
- ***Networks of excellence*** will be used to promote durable integration of key competencies where still needed, so as to support integrating research activities in strategic areas for European competitiveness. These Networks should show clear impacts in structuring and reinforcing research capacities in the fields covered by the Theme. Training is an integral part of the activities. Networks of excellence are not foreseen in 2008.
- ***Coordination and Support actions*** may relate to coordination and networking activities, at European and international, national or regional level (organisation of events, studies, where relevant, organisation and management of joint or common initiatives); activities to support the implementation of the Theme (including dissemination, information and communication); 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.

I.8 Other activities within the programme

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

- the use of appointed **external experts** for the evaluation of project proposals, and as independent observers at these evaluations, and, where appropriate, for the reviewing of running projects, and for focus groups (evaluation);
- **studies** into relevant future needs of industry and society; whilst proposals for "bottom up" studies may be submitted as Coordination and Supporting Actions, "top down" studies will be implemented through public procurement;
- the use of **external assistance** (by "Project Technical Assistants") as necessary to enable detailed, prompt, pro-active, and scientifically competent following of the projects by the Commission (to be implemented through public procurement);
- where appropriate, the Commission will issue **Calls for Tender for public procurements** 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.

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

- **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 projects from the 6th Framework Programme and studies of the longer term impact of Community funding of research in certain areas / disciplines / sectors.

Given that the possibility to assess the impact of RTD funding programmes is limited by the availability of adequate methodologies, NMP may also contribute to the development of novel or improved methodologies aiming at the chain from RTD result to innovation to impact.

- **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. These initiatives are implemented through public procurement.

- **Risk Sharing Finance Facility** In addition to direct financial support to participants in RTD actions, the European Community will improve their 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 'Co-operation' (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,** The NMP Theme will support the IMS Secretariat for an amount of EUR 0.14 million in 2008[3].

[3] Under the condition that the preliminary draft budget for 2008 is adopted without modifications by the budgetary authority.

Industrial focus

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 generally encouraged across all domains of the NMP Theme.

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 organizational 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. in the case of nanomedicine - diagnostics, drug delivery or regenerative medicine. NMP is committed to undertake specific measures (such as analysis, workshops, etc.) to ensure practical uptakes of this issue together with industry.

II Content of calls for proposals in 2008

The work programme content for Theme 4 – NMP presented below introduces each activity and gives a description of the research topics for which proposals are called. 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. It will nevertheless be the task of the proposers, on a case by case basis, to identify in detail the expected quantitative and qualitative impacts of their project.

Each research topic specifies **which funding scheme** is to be used.

For the NMP Theme, the **evaluation** of proposals for Collaborative projects (including those dedicated to SMEs) and Networks of Excellence 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 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.

Theme 4 activities and its related topics described below will be implemented through calls for proposals as described in *Section IV: Implementation of calls*.

The multidisciplinarity of the NMP Programme and the preparation of the WP

The NMP theme within the Specific Programme "Cooperation" under FP7 has as its main strategic objective the transformation of EU industry. It therefore 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.).
- 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.
- The necessary synergetic **integration** of RTD from these three technological domains, wherever this is possible, is evident to everyone.

No other FP7 Theme presents such characteristics related to practically all human endeavour. Moreover, the **sustainability** concern (balance in economic growth, social well-being and environmental protection) resides at the centre of any industrial RTD development. In particular, environmental challenges such as climate change and resources scarcity are the sources of both constraints and opportunities for technological developments. All the above require close attention and cooperation with several **other FP7 Themes**.

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. The NMP programme is the most involved among FP7 Themes, since it is directly related to 10 and indirectly to 15 of these 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.

The multidimensional elements identified above present a challenge for the preparation of a common Work Programme for NMP. For instance, a topic appearing under one of the first three activities (N, M, P) might well have as many integration threads as a topic under the "Integration" activity itself, while topics stemming from the strategic vision of a particular ETP may appear either under the "Integration" activity or under any one of the other three.

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; 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.

Emphasis will be placed on the exploration of new concepts and approaches for various sectoral applications, with some emphasis during first calls on equipment related to healthcare and bioscience. This will increasingly require the integration and convergence of emerging technologies at the nanoscale. Interdisciplinary, integrating theoretical and experimental approaches must be promoted. The research will also address the relevant instruments, tools, pilot lines and demonstration activities required for highly novel approaches to nanotechnology-based manufacturing in the most promising industrial sectors.

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: An action plan for Europe 2005-2009" (COM(2005) 243).

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.

4.1.1 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 related disciplines, cognitive sciences, social sciences, etc.

NMP-2008-1.1-1 Converging sciences and technologies (nano, bio, info and/or cogni)

Technical content/scope: Convergence between nano-, bio-, information and/or cognitive sciences and technologies is extremely promising for substantial innovation in novel beneficial products/services and to give impetus to the competitiveness and profitability of a wide range of European industrial activities. Such interdisciplinary approach presents, however, a great challenge in many respects. The expected projects should enhance understanding and advance as much as

possible in the design and construction of new components, devices, systems or products/services with expected benefits such as improving quality of life, safety, security, industrial processes, and/or the machine /operator interface. Projects should address interaction and convergence between physics, chemistry and/or biology, and cognitive, nano-, bio- and/or information sciences and technologies. The expected projects can include modelling, where appropriate. A non binding or limiting example is the development of knowledge leading to, the creation of new types of nanotransducers, nanobiosensors including isolated sensors, robotics developed at nanometre level or bio-NEMS, technologies for compensating or alleviating the effect of human disabilities including e.g. contactless brain-machine interfaces. Nano-dynamic systems can also be addressed by the proposed projects such as molecular motors or machines.

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

Special features: None

Expected impact: (i) Innovative scientific and technical research going well beyond the state of the art; (ii) development of new knowledge with a high prospect for potential applications; (iii) contribution to substantial innovations in the European industry; (iv) priority will be given to proposals having appropriate industrial partnership in order to achieve the targeted objectives.

NMP-2008-1.1-2 Support to outreach and communication in nanotechnology

Technical content/scope: Providing European citizens and stakeholders with science-based, balanced and up-todate information on nanotechnology is part of the European Commission's approach as well as appropriate initiatives in communication and outreach. The proposed support action(s) should aim at informing a broad public about nanotechnology, such as a series of citizens' conference in most (if not all) EU and Associated States, a dedicated programme using multi-media support, a handbook, an educational 'nano-kit' or other appropriate solutions. The proposed action(s) should present nanotechnology in a balanced way, including challenges or critical aspects where appropriate, so as to provoke a sound, science-based dialogue. Feedback mechanisms for opinions on nanotechnology should be included and analysed according to regional, demographic or cultural differences. A focus on one or more nanotechnology subareas which are most interesting or relevant for the public is possible. An interaction with local, regional or national authorities, science organisations, NGOs and other stakeholders can be considered, where this is relevant. A product dedicated specifically to children and younger people with the objective of attracting their interest to nanotechnology and its research would also be eligible within this call.

Funding scheme: Coordination and support actions aiming at supporting research activities.

Specific features: Several CSAs with different foci could be funded under this call. Duration, number of partners and budget can differ substantially depending on the content and objectives.

Expected impact*:* (i) contribute effectively in raising the awareness of Europe's citizens on nanotechnology; (ii) support the activity of various stakeholders: researchers, industrialists, investors, museums and/or schools; (iii) enhance support to good governance in nanotechnology; (iv) contribute to the implementation of the European Commission’s Action Plan for Nanotechnology.

NMP-2008-1.1-3 Examining capacity building in nanobiotechnology

Technical content/scope: The field of nanobiotechnology is an extremely rapidly growing research area. Challenges are big, in particular since nanobiotechnology greatly benefits from an interdisciplinary ("converging") approach, including (i) various scientific and technical disciplines, (ii) entrepreneurship for transforming new knowledge into value-added technologies (often with the creation of new SMEs), and (iii) societal, ethical and regulatory considerations in order to correctly

cope with European people's expectations and concerns. Ancillary aspects can also play a critical role to achieve or fail to achieve success at European level, such as nomenclature, specific metrology, harmonisation work for potential standards, (certified) reference materials, intellectual property rights as well as dedicated education and training, and the service to industry and particularly to high-tech SMEs. Therefore, the involvement of actors with expertise in many aspects is needed in order to develop nanobiotechnology successfully and timely, and this requires a Europe-wide effort. The support action should explore the definition, establishment and further development of a European scale infrastructure on nanobiotechnology, and the establishment of a realistic roadmap. It will also address the identification of top-class activities carried out in Europe, assessing their positioning with respect to the international scene.

Funding scheme: Coordination and support actions aiming at supporting research activities.

Specific features: Maximum duration: 12 months.

Expected impact: (i) Capacity building in Europe in nanobiotechnology; (ii) support for the development of new nanobiotechnology-based products and industrial processes, for their reliability, safety and future commercialisation on the global market; (iii) implementation of the European Commission's Action Plan for Nanotechnology; (iv) elements relevant to establishing the creation of one (or more) leading *pole(s) of excellence* that will be able to support industrial activities, in particular benefiting high-tech SMEs.

4.1.2 Nanotechnologies and converging technologies

Europe enjoys 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 sectorial 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 nomenclature, metrology and standardisation.

NMP-2008-1.2-1 Pilot lines to introduce nanotechnology-based processes into the value chain of existing industries

Technical content/scope: The transfer of promising nanotechnology research results into new industrial technologies still represents a bottleneck. The expected projects must focus on the development or scale-up of innovative nanotechnology-based processes to a pilot-line-scale in order to improve industrial processes and production lines. The expected projects will also demonstrate how nanotechnology can significantly improve the value-chain in industrial production towards high-added value innovative products, thereby enhancing European competitiveness. The economic aspects of the proposals are therefore crucial and possible solutions should present a strong link to market needs. The projects could include appropriate modelling, an assessment regarding public health and consumer protection, occupational safety and the environment, as well as an evaluation of impacts on regulation. In the case of so-called "nano-plates", surface treatments are excluded, as they were already covered in the first FP7 NMP call for proposals; to clarify: nano-plates are intended here as nano-objects with 1 dimension on

the nano-scale. Surface treatments of nano-rods and nano-particles can be addressed; to clarify: nano-rods have 2 dimensions on the nano-scale (such as nanotubes, nanowires or nanofibers) and nano-particles have 3 dimensions on the nano-scale. Issues specifically addressed by the call NMP-2008-4.0-3 (see below) on "Nano-technology enabled applications for integrated, cost-effective volume production" (with 2008 focus on *nano-structured surfaces for the manufacturing equipment industry*) are excluded.

Funding scheme: Large-scale integrating collaborative projects.

Specific features: 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. Additional activities other than research could be included as appropriate, such as metrology for online monitoring and control, safety issues, specific education modules or the analysis of existing and required regulations. If appropriate, accompanying life cycle assessment (LCA) studies should be performed according to ISO 14040ff and the data should be provided according to data format and quality requirements set up by the European Platform for LCA (http://lca.jrc.ec.europa.eu).

Expected impact: (i) Solutions going well beyond the state-of–the-art; (ii) stimulation and acceleration of the industrial take-up of novel nanotechnology-based solutions within existing or new production lines; (iii) increase of value added of components and products with the most promising industrial and market potential and/or improvement of yield, reliability and throughput of the production equipments and/or reduction and prediction of equipment maintenance which guarantees the highest possible quality of manufactured components; (iv) new competitive industrial processes; (iv) sustainable development, through the development of environment-friendly, resource-efficient products and processes.

NMP-2008-1.2-2 Nanotechnologies for water treatment

Technical content / scope: Nanotechnology presents many benefits for environmental technology applications, such as remediation, treatment or sensor development and monitoring purposes. In the field of water, nanotechnology has the potential to contribute to long-term water quality, availability, and viability of water resources such as through advance filtration that enables sustainable water reuse, recycling or desalination. The aim of this action is to support research and technological development in the field of water treatment by applying developed or adapted nano-engineered materials to promising separation, purification and/ or detoxification technologies. Proposals should focus on process intensification aiming at improving selectivity, robustness, stability and performance while reducing energy requirements and by-product generation. Specific monitoring issues, as well as safety, environmental and health aspects, should be included if directly associated with the new technological solution proposed. Priority will be given to novel ideas and emerging technologies promising major advances and a large potential impact in the long-term, including cost-effectiveness.

Funding scheme: Collaborative projects (small or medium-scale focused research projects). The requested Community contribution shall not exceed EUR 2.5 million.

Specific features: This topic is implemented via a joint call with Theme 6 – Environment (including Climate Change). See the call fiche in Section IV (call identifier FP7-ENV/NMP-2008-2).

Expected impact: Development and uptake of innovative and cost-efficient water treatment technologies benefiting from progress and advances made in nano-sciences, materials and technologies. This initiative should deliver step-change advances in water treatment technologies, including validation and verification of arising prospects in terms of improving treatment performance and reducing energy requirements. By fostering the knowledge base in this area, the

projects addressing this topic will contribute to strengthening European competitiveness in the water sector and the implementation of the Environmental Technologies Action Plan and the Nanotechnology Action Plan.

NMP-2008-1.2-3 Development of technologies for the controlled combustion of nano-particles

Technical content / scope: The Implementation Action Plan of the European Technology Platform for Sustainable Chemistry highlights the potential of nanoparticles for the realisation of improved and/or novel solid fuels. For instance, by making use of high oxidation and redox processes, metallic nanoparticles have a great potential as a source of energy in the form of solid fuels. The Implementation Action Plan also states that at present this idea is theoretical, therefore preliminary research into the viability is necessary, which will hopefully lead to a first generation of solid fuels for the mass market. The expected projects should be focused on and address such research with the view of possible future use in various fields of transportation. Topics that may be addressed are e.g.: how to control the burn rate; production of the most appropriate nanometal clusters; waste oxide recycling; etc. The expected projects may also explore the use of metal oxides as combustion catalyser in engines in various fields of transportation. Safety (including possible explosion) and sustainability issues will also be addressed.

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

Specific features: 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.

Expected impact: (i) Solutions going well beyond the state-of–the-art; (ii) stimulation and acceleration of industrial change; (iii) support to European policies; (iv) sustainable development; (v) priority will be given to proposals having appropriate industrial partnership in order to achieve the targeted objectives.

NMP-2008-1.2-4 Study about best practices for IPR and licence agreements for collaborative research and technological development projects in nano- and converging technologies

Technical content/scope: The expected coordination and support action shall carry out a study about best practices for IPR, and licence agreements and model licences in nano and converging technologies. Nanotechnology is a interdisciplinary field were different approaches and traditions come together, also in the field of IPR. A good example is the tendency towards non-exclusive licences in the electronics sector compared to the more exclusive approach in the pharmaceutical sector. This difference of IPR cultures is even more valid for convergent technologies. The expected support action should analyse both problems and best practices in terms of patenting versus non disclosure strategies (trade secrets), exclusive vs. non-exclusive licences, cross licences, patent pools, usage of trademarks, etc. A possible outcome of this action could be a contribution to the development of guidelines for IPR and licensing agreements in different highly interdisciplinary sub areas of nano- and converging technologies.

Funding scheme: Coordination and support actions aiming at supporting research activities.

Specific features: Expected duration: Maximum 12 months. Only one action will be funded.

Expected impact: (i) Support to European Research projects in the field of nano- and converging technologies; (ii) support to the transfer of knowledge from university to industrial production and the market; (iii) guidance for implementing or adapting IPR agreements and rules in European research projects; (iv) support to the exploitation of research results at the earliest possible stage;

(v) support to good governance in nanotechnology; (vi) implementation of the European Commission's Action Plan for Nanotechnology; (vii) practical recommendations for future appropriate measures, where needed.

4.1.3 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 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.

NMP-2008-1.3-1 Validation, adaptation and/or development of risk assessment methodology for engineered nano-particles

Technical content/scope: Are the risk assessment tests currently used appropriate for specific materials at the nano-dimension? The development of new nanotechnology-based products needs to be complemented with a scientifically valid assessment of the potential risks from nanoparticles to human health and to the environment. Current knowledge may still be incomplete, but future production routines need validated methodologies as basis of an appropriate systematic risk assessment. The expected projects should be related to validating, adapting and/or developing risk assessments methodology for engineered nanoparticles and should address one or more of the following areas:

a) Comparison and validation of current (and/or development including validation of new) standard test methods and test schemes, including in vitro and in silico methods, to detect adverse effects from nanoparticles to human health; acute and chronic toxicity (oral, inhalation, dermal), toxicokinetics, etc.

b) Comparison and validation of current (and/or development including validation of new) standard test methods and test schemes, including in vitro and in silico methods, to detect adverse effects from nanoparticles to the environment; eco-toxicity tests, bioaccumulation, persistence, etc including bioavailability and explosion characteristics as well as their likely environmental/health impacts.

c) Relevant reference and/or certified reference materials.

Funding scheme: Large-scale integrating collaborative projects.

Specific features: 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. Only one project will be funded.

Expected impact: i) Support to stakeholders' decision making concerning nanotechnology: 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-2008-1.3-2 Impact of engineered nanoparticles on health and the environment

Technical content / scope: Continuing and expanding the activities launched with the first FP7 NMP call for proposals, research financing is made available for an understanding of the safety, environmental and human health implications of nanotechnology-based materials and products; this is important worldwide. Reinforced cooperation has been initiated on this matter with several USA federal agencies. It is advantageous to share and harmonize the research effort to increase efficiency and prevent any duplication of effort, also since it addresses pre-competitive questions. This research will create a reliable and sound foundation for the assessment of the safety of nanotechnology-based products and encourage nanotechnological advances that can address the needs of citizens and contribute to sustainable development objectives. The expected projects should be related to engineered nanoparticles and should address one or more topics in the following areas: (a) potential impact on health; (b) potential impact on the environment.

The expected projects may address one or more of the following issues: hazard characterisation, occupational, human and environmental exposure throughout the life cycle of nanomaterials, toxicology, main endpoints of and health effects of engineered nanoparticles; methodologies for testing; monitoring/detection of engineered nanoparticles in the various environments (excluding the development of equipment); environmental and biological fate, transport, and transformation of nanoparticles in various compartments such as air, water, soil and biological fluids. The interdisciplinary research should contribute to better understanding of toxicokinetics, cellular and molecular mechanisms, behaviour and fate, bio-persistence, biokinetics, to understand fundamentally the exposure, behaviour, mechanisms, consequences and potential effects to various endpoints of nanoparticle-biological entities interactions. In their analysis of the state of the art, the expected proposals should demonstrate clear novelty and not duplicate running or carried out research, except in duly justified cases.

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

Specific features: This topic is well suited for cooperation with research teams from non-EU countries, such as with the USA, Canada, Japan, Korea, Australia and New Zealand, and with ICPC. EU funding is foreseen within the present call only for ICPC, such as Brazil, China, India, Mexico, Russia or South-Africa. Gender issues should be considered, where appropriate.

Expected impact: (i) Better *in vitro* or *in vivo* methodologies for the regulatory demands for the safety assessment of nanotechnology products, (ii) better understanding of the impact of the nanoparticles on health, safety and the environment; (iii) future definition of appropriate measures, where needed; (iv) safe and cost-effective minimisation of the exposure of workers; (iv) sustainable and responsible development; (v) support to research and regulation; (vi) implementation of the European Commission's Action Plan for Nanotechnology; (vii) reinforcement of the international dimension of European research within the 7th Framework Programme.

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. According to the new models of manufacturing industry, it is the materials themselves which are becoming the first step in increasing the value of products and their performance, rather than the production steps.

Research will focus on 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 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. nanocomposites), 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 materials phenomena, in particular the structure–property relationships at different scales, to improve materials assessment and reliability including resistance to aging, and to extend the concept of virtual materials for materials design. The integration of nano-molecular-macro levels in chemical and materials technologies will be supported for developing new concepts and processes such as in catalysis, and in process intensification and optimisation. Issues related to process development, scaling-up and industrialisation of high added value materials will also be addressed, as these are essential in many sectors of European industry.

Materials are key for today's technological advances and therefore their applications are highly relevant to all the other FP7 Themes. Theme NMP mainly focuses on advanced materials design, development and processing, while other Themes are more concerned with research related to the use of materials in their respective fields of application.

4.2.1 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.

NMP-2008-2.1-1 Nanostructured membrane materials

Technical content / scope: Tailor-made nanostructured membrane materials show great potential in the area of waste gas or fluid separation having very significant environmental implications. The control of nano-level phenomena is very important in order to enhance the performance of porous materials for selective gas or fluid separation. Research is needed for the development of radically new nanostructured membrane materials, organic and inorganic, as well as on their characterisation and processing methods. The design of novel copolymers for the creation of defined membrane structures by self assembly of block-copolymers and the development of new high free volume polymers with pores in the nanometre range are also very promising fields. Nanostructured membranes that are thermally stable and very selective at high temperatures are important, for example, for gas separation in power generation plants. The projects should aim at radical innovations in the design and development of new nanostructured membranes and in their processing techniques, for example by controlling parameters (such as temperature, pressure, chemical dosage, pH and deposition sequencing) that will enable the fabrication of problem-specific, permeability selective, nanostructured membrane materials. Modelling of transport through the nanostructured membranes under study should provide a better understanding of separation processes, leading to porous structures with high fluxes and high selectivity.

Funding scheme: Small or medium scale focused collaborative projects.

Special features: 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.

Expected impact: Gas and fluid separation for environmental technologies, e.g. CO_2 separation in power stations, particularly in the light of commitments under the Kyoto Protocol. Development of membranes with improved selectivity towards higher hydrocarbons and with a commercial level of throughput.

NMP-2008-2.1-2 Processing and upscaling of nanostructured materials

Technical content/scope: The availability of large amounts of specifically tailored nanostructured materials is crucial for the successful development of new products. The processing of these nanostructured materials and their upscaling to enable industrial use still has many challenges. Research is needed to achieve technological breakthroughs in the knowledge-based processing methods (both chemical and physical) that would allow the production of nanostructured materials on a large scale, either for further processing, as in the case of nanoparticles, or for final commercialisation. The cost effectiveness and commercial potential of the innovative techniques for generating nanostructured materials, as well as the safety issues in the handling of nanofillers and nanostructured materials, including the treatment of the processing residues, should also be considered. Proposals should focus their activities on the processing of one particular material type.

Funding scheme : Small or medium scale focused collaborative projects.

Special features: 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 and priority will be given to proposals showing a clear industrial leadership.

Expected impact: Large-scale production of advanced nanostructured materials. Commercial availability for specific applications remains a critical issue for many nanostructured materials.

4.2.2 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 tunable dielectrics. The main objective is to design novel knowledge-based smart materials with tailored properties, releasing their potential for enhanced and innovative applications.

NMP-2008-2.2-1 Compound semiconductors for electronics and photonics

Technical content/scope: The semiconductor industry requires the development of new materials to meet the needs of, for example, rapid RF circuits, optical devices, data storage and energy saving solutions for lighting. Furthermore, nanotechnology-based approaches target the production of nanostructured materials required to make progress in the scaling-down of electronics and for photonic devices. Research should focus on novel compound semiconductors (e.g. III-V, II-VI, oxides), with an emphasis on application in nanostructured components. In particular, projects could address semiconductor surfaces with zones of different material on which nanostructures can be built, as well as the effect of the nanostructuring of the semiconductors on their optical, electronic (charge and spin) or conversion properties. Physical and chemical processes to be further developed also include epitaxial growth, soft (dry and wet) etching, functionalising by radicals, low temperature processes and new precursors. Modelling approaches, including validation, are also important for material design.

Funding scheme: Large scale integrating projects.

Special features: 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 and priority will be given to proposals showing a clear industrial leadership.

Expected impact: Novel semiconductors will bring the electronics, photonics, spintronics, optoelectronics, lighting and photovoltaic industries yet another step further in developing higher performance components and devices.

NMP-2008-2.2-2 Nanostructured meta-materials

Technical content/scope: Metamaterials development has produced in recent years a new class of artificially structured composite materials that exhibit unforeseen electromagnetic properties, not readily observed in nature and in the constituent materials. These properties often arise from the inclusion of artificially fabricated inhomogeneities that have dimensions which depend on the wavelength of interest, e.g. nanometres for visible light applications. Research should consider the design and processing of artificial metamaterials, mimicking nature with higher efficiency or exhibiting radically new properties such as negative or extreme electric permittivity or magnetic permeability, and leading, for instance, to such features as negative refractive index, artificial chiral materials, significant reduction in losses, or enhancement of magnetic responses in composites made out of non-magnetic components. The focus should be on the realisation of optical, electronic or magnetic properties of metamaterials with inclusions in the nano and molecular scale, which could result in innovative collective responses at elevated frequencies.

Funding scheme: Small or medium scale focused collaborative projects.

Specific features: 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.

Expected impact: Design and processing of novel materials expanding the existing range of electromagnetic properties, with potential new applications of interest for the optics, photonics, electronics, and telecommunications industries.

4.2.3 Novel biomaterials and bioinspired materials

Biomaterials are nowadays essential for improving human health, quality of life and environmental protection. Originally foreseen with an aim to minimise 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-2008-2.3-1 Advanced implants and bioactive materials for critical organs

Technical content/scope: Medical therapies for human critical organs such as the heart, liver and pancreas are currently limited by the availability of adequate biomaterial implants, advanced devices and engineered tissues. The specific challenges for the different critical organs require diversified approaches in the case of cardiovascular, pancreatic and liver therapies. Research on heart implants and devices should focus on bioactive materials able to attract local cells to the site of injury and on new biomimetic materials for cardiac tissue and vascular replacement (e.g. myocardium, grafts, valves, stents). Biomaterials development is crucial for diabetes treatment and research is required on biomaterials for the delivery of bioengineered pancreatic cells and on strategies for artificial pancreas development. Research on biomaterials for liver diseases (e.g. cirrhosis, hepatitis) should focus on biomimetic materials for site specific cell therapy and on bioactive materials (e.g. membranes) for regeneration of hepatocytes.

Funding scheme: Small or medium scale focused collaborative projects.

Special features: 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.

Expected impact: Advanced biomaterial implants could reduce the need for organ replacement, and could help accelerate the development of new therapies, eliminating the need for organ transplants and immunosuppresants altogether. Projects are expected to enhance the competitiveness of the biomaterials industry.

4.2.4 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-2008-2.4-1 Inorganic-Organic Hybrid Materials

Technical content/scope: Recent breakthroughs in the design and processing of inorganic-organic hybrid materials have been driven by the rapid growth of their use in emerging applications such as energy conversion and storage, sensors, tissue engineering, environmentally friendly catalysis and information storage. A fundamental understanding and control of their properties, which combine robustness with versatility, is required for the rational development of new hybrid materials with engineered nanostructure and for their application in novel processes. The focus should be on radical innovation in highly ordered organic-inorganic hybrids, such as metal-organic frameworks (MOFs), ordered mesoporous materials, chemically- or physically-tailored ordered nanostructures and ordered arrays of inorganic and organic components. The specific advantages of these systems are their versatility due to their potential for tailoring the pore size, very high surface area and diffusivity. They can, therefore, be designed to yield potential applications in a wide range of different scientific fields (e.g. gas purification, separation, gas storage and catalysis). Projects should be based on interdisciplinary partnerships combining high level modelling, synthesis and characterisation of the proposed materials. Hybrid nanocomposites, tissue engineering and hydrogen or methane storage applications are excluded.

Funding scheme: Large scale integrating collaborative projects.

Special features: 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 and priority will be given to proposals showing a clear industrial leadership.

Expected impact: Emerging applications of novel hybrid materials such as in environmentally friendly catalysis, energy conversion and storage, sensors, information storage, etc. Real breakthroughs in the design and processing of these materials would have far reaching consequences for the future competitiveness of the European industry in many different sectors.

NMP-2008-2.4-2 Radical advances in the processing of multifunctional films and tapes

Technical content/scope: The development of advanced processes to produce high surface or long length multifunctional organic and inorganic films and tapes has been hindered by the difficulty to monitor and control during processing the complex structure responsible for their properties. As an example, superconductivity technologies have not delivered their full potential due to a number of unsolved material critical issues, such as control of nanostructure for high current density, improvement of pinning properties, control of thermal and mechanical stability, etc. Research should target radical advances in optimized, high yield processing and production technologies that allow control of multifunctional materials at the nanoscale, to obtain in particular large area multifunctional organic or inorganic films, smart windows or long length coated superconducting

wires and tapes, with improved performance at competitive costs. Conventional metallic tapes are excluded.

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

Special features: 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.

Expected impact: Development of cost effective and high yield processes to produce multifunctional organic and inorganic films and tapes, e.g. for applications in the fields of energy distribution and storage, thin-film photovoltaics and smart windows.

4.2.5 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.

NMP-2008-2.5-1 Functionally graded materials for improved mechanical performance

Technical content/scope: Functionally graded materials are composite materials which enable a more efficient use of existing homogeneous materials by introducing gradual variations of their properties (such as hardness, wear resistance, thermal and electrical conductivity, density and Young's modulus) through gradients of composition, structure, texture, phase distribution or particle content. For instance, the gradual transition between a heat or corrosion resistant outer layer (often a ceramic) and the tough metallic base material increases in most cases the life time of the component. A specific challenge is the necessary joint design of the functionally graded material and the component where it will be used, in order to create tailored solutions adapted to the specific working conditions envisaged. Particular attention needs to be paid as well to the upscaling from laboratory scale to industrial use, especially regarding the complexity of processing methods and final component costs. Research should focus on functionally graded materials which, by the tailoring of their nanostructure, provide radical improvements of the mechanical performance in transport applications, in particular under extreme conditions in turbines (e.g. functionally graded thermal barrier coatings), providing lightweight structures in power train applications or upgrading crash worthiness of vehicle body and chassis. New concepts for designing tailored materials are expected to rely on multiscale modelling, characterisation and non-destructive evaluation techniques and the fundamental understanding of residual stresses and degradation mechanisms.

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

Special features: 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.

Expected impact: Functionally graded materials have potential benefit for a wide range of industrial sectors. Proposals should target aerospace, automotive or other transport applications.

NMP-2008-2.5-2 Modelling of interfaces for high performance materials design

Technical content/scope: Understanding the behaviour of interfaces at the boundary of two different materials or material phases, for example at the interface between alloys with different alloy concentration, differently doped materials, systems with different strained layers or with different electromagnetic properties, has become increasingly important for many material applications. Despite the existence of many thermodynamic and transport property models for interface modelling, there are still systems and conditions for which no accurate model is available. The projects should propose advanced modelling approaches addressing interfacial phenomena which are relevant to the study, design and processing of high performance materials with radically new properties, and in particular nanostructured materials. The focus should be on the modelling of realistic systems that can predict material properties and behaviour on a usable time scale and take advantage of the potential of multi-scale approaches. Validation of the models against experimental results should also be addressed. Research which is only of relevance for surfaces and coatings is excluded.

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

Special features: 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. This research area is particularly well suited for cooperation with Third Countries (e.g. United States, Russia, China, India), which can help ensure a larger impact. Funding of Third Countries is in line with the rules of participation for FP7.

Expected impact: Better understanding of the physical, chemical and biological processes taking place at the different types of interfaces. The emphasis should be placed upon the modelling of realistic interfacial systems. Projects are expected to help maintain a leading position for European science in the field.

4.2.6 Coordinated activities and international cooperation

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 industrialised countries and those having signed an S&T cooperation agreement which includes the Materials field. In addition, specific support and coordinated actions can promote better links with international co-operation partner countries.

NMP-2008-2.6-1 Novel materials for energy applications (Joint call with Energy)

Technical content/scope: In most cases, real breakthroughs in the energy sector can only come from progress in basic materials science that underpins energy technologies. Research should focus on a wide spectrum of novel materials and nanomaterials for energy applications with an orientation towards long-term innovation. The research activities supported should go beyond conventional approaches, and be highly novel, very ambitious and of long term nature. The expected impact of these projects will be judged in the first instance on the radical upgrade in the properties of the materials, but this improved performance must be in areas where energy technology benefits are to be expected and, in this context, multidisciplinary approaches are of particular interest. Projects should contribute to the establishment of strong strategic positions for Europe in emerging materials science areas of technological relevance. Important fields of application for energy technology are energy conversion and storage, photon capture, and CO_2 capture and storage.

Funding scheme: Collaborative project

Special features: Joint Call with Theme 5 – Topic ENERGY-2008.10.1.2 (under Activity Energy.10: Horizontal Programme Actions). This Joint call is particularly well suited for cooperation with top class research groups from Third Countries, in particular Emerging Economies and Industrialised countries, which can help ensure a wider impact. It is also encouraged to include in the projects activities related to benchmarking and validation (testing) of the new materials, which would have a positive effect on the industrial impact. Projects under this call shall have a maximum requested EC contribution of EUR 3 Million. This is an eligibility criterion.

Expected impact: Exploration of radically new paths leading to highly innovative, long term research in the field of materials for energy applications and contribution to the establishment of strong strategic positions for European science and technology in emerging areas. The potential impact on the future energy system has to be clearly demonstrated.

NMP-2008-2.6-2 Computational Material Science - Coordinated Call with India

Technical content/scope: In the framework of the EU-India S&T Cooperation Agreement, the European Commission representing the European Community (EC) and the Department of Science and Technology (DST) of the Government of India are working together to enhance opportunities for coordinated activities in materials research between European and Indian teams. Computational modelling has become a major tool to understand materials properties, as well as in their design and industrial use. Multidisciplinary efforts using the powerful computational tools of materials modelling are essential for the understanding of the complex behaviour of new knowledge based materials. Numerous methods are now available, ranging from ab-initio calculations and molecular dynamics to the macroscopic level.

The proposals for coordinated projects must be clearly relevant to computational materials science at the frontier of knowledge. The expected coordinated projects should focus on the understanding and modelling of materials properties, processing and performance. Various computational approaches can be considered, including ab-initio theories, model Hamiltonian methods, atomic simulation tools such as MC and MD, FEM, DEM, Quasi continuum approaches and, with a particular emphasis, multi-scale simulation methods which take into account scale integration covering from the atomic level to continuum approaches. The links between simulation, theory, experiment, validation and use should be taken into account.

Areas of computational materials science covered include, but are not limited to, modelling of nanomaterials, metallic materials, ferroic materials, ceramics, polymers, composites, nature-mimicking materials, biomaterials, green solvents, alloys, clusters, interfaces, size-dependent effects, dislocations, diffusion, electronic and optical properties, as well as different aspects of the thermal and mechanical behaviour of materials.

Funding scheme: Small or medium-scale focused research projects, carried out in coordination with DST (India).

Additional eligibility criteria
For each project, the maximum EC funding requested must not exceed **EUR 1 million.**
Proposals which do not include coordination with an Indian project will be considered ineligible. Therefore, the EC proposals must include a detailed explanation about the coordinated Indian proposal to be submitted to the DST.

Special features: To ensure a project implementation that reflects a genuine EU-India cooperation, priority in evaluation will be given to proposals showing a balanced effort between the two coordinated projects and where the research plan involves properly coordinated research activities between Europe and India. The proposals should also take into account the exchange of researchers, so that any accommodation (board and lodging) of the Indian researchers in Europe should be paid by the European host institution, whereas that of the European researchers in India should be paid by the Indian host institution.

Additional selection criterion: Proposals will only be selected on the condition that the corresponding coordinated project is also selected for funding by the DST.

Expected impact: An EU-India Materials Science partnership, supplemented by two-way mobility of researchers, can help 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 European and Indian societies. Reinforcement of the international dimension of European Research within the 7th Framework Programme and of Indian Research. Validated predictive models should contribute to the development of new materials, including newly emerging nanostructured materials, for the flexible production of knowledge-based products leading to industrial competitiveness.

NMP-2008-2.6-3 Coordination actions with Materials researchers in major world regions

Technical content/scope: Coordinated Actions creating strategic partnerships in the area of materials science, involving partners in groups of Third Countries in specifically-targeted major world regions, can support European scientific and economic development in today's globalised world. The initiatives should consist, in particular, of technical seminars, workshops, short-exchange schemes, thematic summer schools and/or similar events, within the field of materials science, including nanomaterials. The goal of the coordinated action is to gain first hand knowledge of the state of the art in specific areas of materials research that are of interest for Europe and for the specifically-targeted major world region. The action should also provide a 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 partnerships that will be able to submit joint proposals under the forthcoming calls of the 7th Framework Programme and to identify topics of mutual interest for future coordinated calls and other initiatives to foster cooperation.

Funding scheme: Coordination and Support Actions aiming at coordination of research activities.

Special features: To ensure a larger impact, priority will be given to proposals involving a balanced participation of partners from Europe and from the targeted world region. In the case of USA, Japan, Russia, China, India and Brazil, each country can already be considered as a world region.

Expected impact: Reinforcement of the international dimension of European research within the 7th Framework Programme and implementation of the new approach to International scientific and

technological cooperation. Facilitating joint projects and the realisation of future coordinated calls with major world regions.

NMP-2008-2.6-4 ERA-NET PLUS on Materials Research

Technical content/scope: The main aim of this ERANET Plus is to pool the necessary financial resources from the participating national (or regional) research programmes and the Community with a view to launching a single joint call for proposals for research projects in the Materials field that will be evaluated and managed jointly by the participating programmes. The joint call should clearly focus on an interdisciplinary approach to materials research and on the synergies derived from cooperation at an international level. Thematic focussing of the joint call should be commensurate to the available funds to ensure a reasonable success rate. Details of topics covered by the call will be decided by the participants in due time but shall be finalised in consultation with the Commission Services concerned. An ERANET Plus on Materials Research is aimed to improve the coordination of national research activities and policies in the domain of materials research. A Community contribution to the joint call budget serves as an incentive. The subject of the call must have European added value and be of major interest to the Community as a whole.

Funding scheme: Coordination and support action. The Community contribution, that will include limited financial support for the launching of the management of the joint call, will essentially provide for topping up of the national (or regional) contributions of the joint call budget. The total EC contribution for this ERANET Plus project is limited to a maximum of 1/3 of the total of cumulative joint calls budget, up to a limit of EUR 6 million. Complete and detailed information on funding scheme, special eligibility criteria and expected impact on ERANET and ERANET Plus can be found in Annex IV of the cooperation work programme.

Special features: One joint call should be planned with a clear financial commitment from the participants. Eligible participants are programme owners or programme managers (as for ERANET). A minimum of 5 participants from 5 different Member or Associated States providing funding is required. Minimum financial budget of joint call is EUR 5 million. Each project retained for funding should be transnational (i.e. with minimum 2 partners from different countries). Coordination experience between national programmes is a necessary prerequisite.

Expected impact: Better use of scarce resources and the avoidance of double funding/overlap. Reduction of fragmentation of research efforts made at national and regional level.

I.3 Activity 4.3 New production

A new approach to manufacturing is required for the transformation of EU industry from a resource intensive to a sustainable knowledge-based, eco-innovative industrial environment and will depend on the adoption of totally new attitudes towards the continued acquisition, deployment, protection and funding of new knowledge and its use, including towards sustainable production and consumption patterns. 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 and production facilities as well as human resources, while also meeting overall industrial safety and environmental requirements. These production assets will come together in "Factories made in Europe" with European standards.

The research will focus on a number of strands: the development and validation of new industrial models and strategies covering all aspects of product and process life-cycle; adaptive production systems that overcome existing process limitations and enable new manufacturing and processing methods; networked production to develop tools and methods for co-operative and value-added operations at a global scale; tools for the rapid transfer and integration of new technologies into the design and operation of manufacturing processes; and the exploitation of the convergence of the nano-, bio-, info- and cognitive technologies to develop new products and engineering concepts and the possibility of new industries.

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 creation of high tech SMEs.

4.3.1 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-2008-3.1-1 Transformation strategies for SMEs in turbulent global market environments

Technical content/scope: The business environment of the enterprise in global economy is tough and turbulent. While many of the external factors, e.g. demand for products in global markets; the strategies of competitors; and the regional level of wage and reward systems are beyond the direct control of any enterprise, companies which are robust enough and have the capability to continuously transform can survive and be successful in this dynamic environment. Yet, many companies are lacking proper production and transformation strategies. Often the choice of production is dictated by the installed technology base and traditional competencies. These problems are particularly acute for SMEs, which do not have the scale and resources to address all

the changes in their environment, and which are present in traditional as well as in new technology manufacturing sectors.

The main objective is the development of competitive **production and service concepts & strategies** for manufacturing SMEs, responding to the evolution of the manufacturing business environment. The production and service concepts should aim at leveraging the strengths of European manufacturing: customer orientation, flexibility, productivity, quality, design and positive brand image. Research challenges include: the identification of methods for small businesses to recognise and respond to external threats; determining and assessing candidate production concepts and strategies for SMEs to assist in their survival and transformation; defining mechanisms that allow SMEs to take similar advantage from manufacturing in the enlarged Europe compared to those accessible to large companies, e.g. by utilising outsourcing networks; determining the required competences and mechanisms to form or join cooperative transient production networks, increasing the range of business opportunities; determining and disseminating best practice survival and transformation mechanisms developed by successful SME businesses or agencies; and generating tools and techniques that support transformation. The proposals should develop approaches for different SME sectors: (i) SMEs in traditional sectors in need of a structural change; (ii) Globally competing technology oriented SMEs; (iii) SMEs operating in niche markets. The developed production concepts and strategies should be demonstrated in pilot implementations.

Funding scheme*:* Collaborative projects targeted to SMEs.

Special features: 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. SME dedicated collaborative projects are specifically designed to encourage SME participation in research and innovation representing the complete value added of the targeted sectors. Research and innovation activities need to be covered by the projects. At least 35% of the requested EC contribution should be allocated to the participating SMEs. Proposals not addressing this requirement will be considered ineligible. To ensure a larger industrial impact, priority will be given to proposals showing that the projects will be led by 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.)

The following specific requirements will be reflected in the evaluation: (i) to ensure complementarity of the consortium, proposals are expected to include a wide range of competences, including management of SMEs, technology, economy, finance, public organisations (e.g. in charge of industrial development); (ii) as regards the S/T quality & objectives, proposals are expected to take a holistic view on production of products and product services as opposed to developing individual production methods/technologies or products in the interest of a single company; (iii) to enhance the potential impact, development of further take-up measures in collaboration with Eureka Pro-Factory is requested.

Expected impact: The new production and service concepts & strategies should enable SMEs to align their production strategy better with their business strategy. This should enable SMEs to continue to operate regionally but with a global reach thus reinforcing the socio-economic climate at regional level. Improved organisation of production and services should contribute to shorter time to profit and improved overall financial results. Strategic SME tailored planning processes will enable SMEs to move up the value chain more easily. Projects should demonstrate the potential to improve flexibility and customer satisfaction through innovative production strategies. Collaboration processes are expected to allow SMEs to enhance their own core competences while fostering collaboration in a manufacturing network.

4.3.2 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.

NMP-2008-3.2-1 Implementation of process intensification strategies in industrial scale

Technical content/scope: One of the major drivers for required changes in the European manufacturing businesses is competition from emerging countries where large quantity production is cheaper and sometimes even more flexible. In addition, changing customer needs driven by market reaction time requires a higher product diversification and more fast and flexible future production strategies. A European industrially lead initiative involving research and demonstration of new concepts is needed for holistic product and process development. The flexible integration of inherently safe process technologies with small hold-up volumes will be a key to success for future products.

Expected projects should aim at the development of new, intensified process and plant concepts for speeding up the market penetration, for enhancing the product life-cycle and improving sustainable production. The main development tasks are to:

- Develop new production concepts, with a special focus on new start-up and shut-down strategies, which increase process operability;
- exploit the full potential of micro process technologies, such as heat and mass transfer and energy efficiency, with focus on the integration of different unit operations in one apparatus and standardisation of such modules;
- create flexible systems, which are adaptable to the dynamic range of product output during all phases of life cycle management
- minimize the use of resources and improve the eco-efficiency;
- create a methodology based on framework data from model reactions, which enables a profound economic as well as technical evaluation of the new production processes and use these methodology to identify transfer-potential of the new processing concepts for innovative products.

Project objectives should encompass the construction and operation of flexible demonstration plants in which the above scientific concepts will be integrated and implemented. Integrated process units and combined unit operations must be linked with process modeling tools, in-line monitoring, model-based process management and advanced process control to form a centre of gravity for fast process development. This highly integrated technology demonstration platform will generate new opportunities and will lead to future factory concepts for chemical production plants made in Europe.

Funding scheme: Large-scale integrating collaborative projects

Specific features: 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 following specific requirements will also be reflected in the evaluation: (i) to ensure proper exploitation and dissemination of project results, industrial leadership and significant demonstration activities are required; (ii) as regards the S/T quality & objectives, existing activities and initiatives (e.g. by the technology platforms) in the area of process intensification should be taken into account; (iii) in particular, pharmaceutical active ingredients are not considered a priority for this call.

Expected impact: European based chemical production meeting the challenges of increased product diversification, substantially shorter time to process/market and flexible production capacity in accordance with product and market development. A substantial drop in capital expenditure for new plant and/or for retrofit of high–performance intensified devices into existing infrastructure for the high value-added product market (production below 100.000 t/yr).

NMP-2008-3.2-2 Self-learning production systems

Technical content/scope*:* New philosophies in industrial process measurement, control engineering using scalable and adaptive control and multi-sensor systems are required, aiming at the realization of self-learning production systems. Process control, coupled with quality control, must be able to react in time to fluctuations during the process, to changes of process parameters and to disturbance variables. Furthermore the machines and production systems must be able to react flexibly to different product variants in whole or in part. Equipment has to be designed to deal with disruptive or not foreseen events without further human intervention.

The main development targets are: (I) Development of methods for adaptive and scalable tools for representation of complex production processes. That means, amongst others, system-open scalable data acquisition and preconditioning techniques, scalable interfaces to data analysis tools (in terms of II) as well as adaptive integration procedures into measurement / control systems and automatic quality control loops. Additionally, the usability / intuitional operator guidance must be taken into account. (II) Development of data analysis methods / procedures / tools, which are open with respect to the process and necessary analysis algorithm. These procedures should be self-learning, self-configuring and self-optimising, nevertheless taking into consideration the "human element" in the production system[4] . For this it must be possible to train the system, user guided (i.e. using a human knowledge) as well as by system inherent information (i.e. knowledge derived from process observation, feed back loops, process parameter identification, quality records and qualification of reliable and less reliable sensor signals). Output performance should be predicted and monitored through the use of virtual metrology methods. (III) Development of application methodologies for the deployment of modular, adaptive production systems.

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

Specific features*:* 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 following specific requirements will also be reflected in the evaluation: (i) to ensure wide industrial impact, proposals are expected to include component manufacturers and OEMs for future take-up of the new technologies; (ii) in addition, proposals are expected to take into account relevant standardisation and interoperability issues and development; (iii) further take-up measures in collaboration with Eureka Pro-Factory is requested; (iv) as regards the S/T quality & objectives, the proposals are expected to include developments within an

engineering platform framework that would be able to demonstrate the potential of adaptive manufacturing systems; .

Synergies, coordination and collaboration with the ICT thematic priority and in particular Objective Networked Embedded and Control Systems, will be sought, where appropriate.

Expected impact: Factories with self-learning capability are expected to contribute towards increased competitive advantage of European manufacturers' by 10 to 30 percent in the medium to long term. The expected impact will be assessed in terms of explicit reduction of development and commissioning time for factory assets. Further impacts include: reduction of down times during product exchange and conflict situations; improvement of product quality while reducing the need for inspection; increase in machine availability and reduction in maintenance; and improved efficiency of complex production systems.

NMP-2008-3.2-3 Coordination and support of inter-regional manufacturing communities following IMS strategy update

Technical content/scope*:* This coordination activity aims to strengthen international co-operation under the Intelligent Manufacturing Systems (IMS) initiative. It seeks to provide an effective interface to ongoing European roadmapping activities of European Technology Platforms and to create research synergies at international level through establishment of inter-regional manufacturing communities in key activity areas of IMS.

The activities are expected to include: mapping of on-going major research activities in the four priority topics, ensuring effective inter-regional exchange of results and knowledge community building; preparation of ground for future collaborative research activities in IMS regions; preparation of a coherent roadmap 2020 for future manufacturing research within the IMS framework.

The following topics have been identified as areas of activity with international partners from IMS participant countries[5]:

- Sustainable manufacturing: Technology solutions for manufacturing processes and manufactured products which are efficient with respect to resource use (including. energy) and lead to minimal pollution (waste). Measurement and assessment technologies and methodologies to ensure occupational safety including ergonomics, industrial disaster prevention and mitigation and in particular safety of nanomaterials and related manufacturing processes should also be addressed.
- Energy efficient manufacturing: Solutions to improve efficiency and reduce the carbon footprint in energy utilisation for manufacturing and operational processes. This will result in reduced manufacturing costs and global warming impact.
- Key technologies: Technologies that will yield a high impact on the next generation of manufacturing. These technologies include model-based enterprise, nanotechnology, and smart materials.
- Standards: Manufacturing research issues that can benefit from standardization to create open manufacturing and product standards that are accessible to everyone and enhance innovation globally. IMS involvement in standards would also focus on key areas where the lack of standards is impeding progress in any of the other areas of activities.
- Education: Manufacturing education is a major driver for promoting excellence in manufacturing in the years to come. As such, education should address a number of emerging challenges related to industry, academia and the society in general. It should

[5] IMS participant countries/regions are: EU and Norway, Japan, South Korea, USA and Switzerland

generate new education paradigms, through direct involvement of all stakeholders and utilise new delivery mechanisms, such as eLearning and Technology Enhanced Learning. Key issues of manufacturing education are: embedding entrepreneurship and innovation spirit into education, the promotion of interdisciplinary thinking and multicultural working, balancing the loss of a large number of low-skilled jobs by training high-level personnel for new manufacturing jobs, and promoting an integrated approach to education, research and technology transfer.

Funding scheme: Coordination and Support actions aiming atcoordinating research activities.

Specific features: As an eligibility criterion, the consortia must include partners at least from two other IMS countries/regions. Collaboration with the ICT theme will be ensured.

Expected impact: Activities will demonstrate and increase global visibility for the competence of European factory assets suppliers as well as establish global and standardised curricula for manufacturing education. They should also provide societal benefits by leading to global targets in industrial security and safety. The activities should also contribute towards attaining environmental objectives as set out in the European Environmental Technologies Action Plan (ETAP).

4.3.3 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.

NMP-2008-3.3-1 Supply chain integration and real-time decision making in non-hierarchical manufacturing networks

Technical content /scope: The supply chain integration and production/operation management of non-hierarchical manufacturing networks is characterised by non-centralised decision making. Depending on the customer and the product, the rules and procedures for this decision making may change. Furthermore, companies can be part of several production networks at the same time thus making the planning, management and optimisation a very complex task. The main development issues and targets are collaborative planning, management and optimisation of production resources including production planning and capacity management in non-hierarchical company network as well as distributed planning/scheduling models and supporting tools. Also methods and tools for material flow management across the overall network and the product life cycle, integrated production monitoring offering order status information for the customer and the network, equipment monitoring and maintenance, integrated maintenance including real-time monitoring (design, implementation, operation) enabling new and protected services for the production equipment as well as planning and control of reverse logistics / recycling are targeted. The new methods and the supporting tools must work in a decentralised manner enabling the participating enterprises to work in several production networks at the same time. The securing of information and knowledge should also be given a special emphasis, as it is a key to the success of such

networks. Deliverables will take the form of pilot implementations of the new methods and the new business processes as well as the application of enabling ICT tools in industrial settings.

Funding scheme*:* Small-medium scale collaborative projects

Special features: 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 following specific requirements will also be reflected in the evaluation: (i) to ensure a wide industrial impact, the developed solutions should rely on and contribute to international standards; (ii) this topic is well suited for international collaboration, in particular within the IMS scheme.

The topic is a precursor for future large-scale collaborative projects addressing product creation and production in non-hierarchical company networks. Synergies, coordination and collaboration with the ICT thematic priority and in particular Objective Networked Embedded and Control Systems, will be sought, where appropriate.

Expected impact: Non-hierarchical company networks aim at enhancing the competitiveness of European manufacturing sectors by increasing the capacity of industrial SMEs to operate globally in an agile manner, in order to adapt to the rapid evolutions of existing and future markets. A significant reduction of logistics costs, high inventories of current assets and lead times of material and information is expected, benefiting also the customer. Tools for overcoming the complexity of operating in several production networks at the same time should facilitate an increase in the business volume.

4.3.4 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-2008-3.4-1 Rapid design and virtual prototyping of factories

Technical content/scope: Consumer needs and expectations of the future will require a continuously and rapidly evolving production framework: thus production systems, from small to large scale and integrated factories, shall be conceived and set up in shorter and shorter times. This will require conception and development of new methodologies and innovative tools, which enable and support the rapid design and prototyping of the entire production system. The creation of a holistic, integrable, up-gradable, scalable Virtual Factory can foster high cost savings in the implementation of new manufacturing facilities thanks to the effective virtual representation of buildings, resources –process- and products. Decision makers and designers can benefit from the closer integration of product, process and plant development through dynamic modelling, optimisation, simulation and visualisation. The ability to better manage complex automation

through development of integrated e-factory solutions will support rapid New Product Introduction development and reduce the time to market.

The main development targets are: a complete detailed framework for the Virtual Factory and tools for the quick, reliable and optimized creation of knowledge-based manufacturing systems and factory, enabling collaborative, interdisciplinary and multicultural design/analysis and optimisation of processes to be executed effectively and efficiently. The required tools should consist of software using intelligent databases and data analysis and presentation methods, complemented by models, processes and guidelines enabling their usage.

Their capability needs to be proven through successful pilot cases in European manufacturing companies, resulting in as well in significant measurable improvements of business success indicators like time-to-market, customer satisfaction, market share and revenue as in improved soft factors like working climate, quality of life, environmental protection and innovativeness.

Funding scheme: Large-scale integrating collaborative projects.

Specific features: 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 following specific requirements will also be reflected in the evaluation: (i) the consortia should include larger international companies which develop products in international distributed and delocalized teams, smaller scale companies (SMEs), such as suppliers who operate both in local and international scale as well IT technology/services providers, to ensure complementarity of the consortium as well as a wider industrial impact.

All manufacturing production systems can be addressed. It is likely that only one project would be funded under this topic. Should several proposals receive funding, effective collaboration between the projects must be established for ensuring the compatibility of the solutions and for avoidance of overlaps. Synergies, coordination and collaboration with the ICT thematic priority and in particular Objective Networked Embedded and Control Systems, will be sought, where appropriate.

Expected impact: The target is the improvement of the easy plant reconfiguration and reengineering (reduction of 50% of the actual time) through the improvement of the integration of heterogeneous data and the enhancement of the human being interactions. This will speed up the ramp-up phase (target is 30% at least) as well it will allow the collaboration both between people as well among them and machine. The projects will also to create opportunities for SME to be the main provider of these new services.

NMP-2008-3.4-2 Industrialisation through new integrated construction processes

Technical content/scope: Innovation is needed to support the transformation of a supply-driven sector into a sustainable knowledge based demand-driven sector fulfilling users and clients demands, together with the growing trend towards integrated construction teams and long-term supply chain collaboration. A challenge here is to re-engineer the construction process towards a manufacturing process integrating the entire supply and value chain, in order to transform a supply-driven sector into a sustainable demand-driven sector, one that is creative, flexible, innovative, user-oriented, performance and knowledge-based, which offers new business opportunities, integrated and yet built around site specificities and knowledge. A challenge is especially to help an individual SMEs dominated sector to become a fully efficient knowledge-based added value network with integrated actors mastering their process, capitalizing knowledge and responsible thereof.

Topics: In order to industrialise construction production processes we should focus first on the initial phases for capturing and formalising customer needs, transforming requirements into formal sustainable specifications along the value chain to offer configurable / customisable life cycle performance based solutions for new construction products and services. This could be done by

applying the most advanced high technology design/manufacturing methods into off-site construction production. New industrial "nD" models, interoperable methods/tools for analysis, simulation, validation, optimisation of the use of resources, monitoring, visualisation, decision support systems re-using existing knowledge, procurement, configuration and logistics management of manufactured components inline with on-site WIP are likely to be developed. Finally, rapid reliable on-site assembly methods using intelligent equipment, new materials and new manufactured components for mechanisation, quality control, monitoring, automation or robotisation of on-site construction.

Funding scheme: Large-scale integrating collaborative projects.

Specific features: 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 following specific requirements will also be reflected in the evaluation: (i) in order to achieve the targeted industrial impact, the active participation of SMEs is required; (ii) for appropriate dissemination and exploitation of project results, the proposals should also include actions for demonstrating the operation of the new integrated process chain in practise.

Expected impact: The ultimate goal must be resource efficiency (including energy) both in the building phase and in operation. More specifically the targets are: More than 50% of customised construction products are producible industrially; 0% rework and unused materials due to a poor management; Construction sector offers safe and attractive high-technology work places; Sites, construction machinery and mobile staff are 100% connectable to corporate information networks; 100% of manufactured construction products are offered on the EU wide open market.

4.3.5 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.

NMP-2008-3.5-1 Volume production process chains for high throughput micro-manufacturing

Technical content / scope: The objective is the development of integrated processes for micro-production and finishing that combine innovative processes enabling performing manufacturing capabilities for emerging micro-products with high market impact to be demonstrated.

The proposed work must significantly extend the range of microfabrication process capabilities by encompassing a wider range of materials and geometric forms and by defining processes and related process chains that can satisfy the specific functional and technical requirements of new emerging multi-material micro-products in sectors such as telecommunications, medical/surgical, transport, biotechnology and consumer products. In addition, the compatibility of materials and processing technologies throughout the manufacturing chains needs to be ensured for reasons of robustness and

cost-effectiveness.

Main development issues must include:

- Integration potential of innovative micro-manufacturing technologies, their constraints and commonalities.
- Methodologies for integration of different manufacturing technologies into common process chains.
- Process integration to achieve compatibility of materials and processing technologies throughout the manufacturing chains.
- High throughput micro-manufacturing process chains with build-in capabilities for "easy and fast" on-line inspection process monitoring and control.
- Establish “design for manufacture knowledge base” and rules that will shorten the product development cycle through rapid process and manufacturing chain definition and implementation into existing industry processes and promote manufacturing standards.
- Industrially feasible systems/platforms that validate all stages of process integration.

Deliverables should demonstrate significantly higher production rates, accuracy, and enhanced performance/quality, creating capabilities for the serial manufacture of micro components and/or miniaturised parts incorporating micro/nano features in different materials. Processes should also provide a higher flexibility for seamless integration into new micro/nano manufacturing platforms.

Funding scheme: Collaborative projects targeted to SMEs.

Specific features: 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. SME dedicated collaborative projects are specifically designed to encourage SME participation in research and innovation representing the complete value added of the targeted sectors. Research and innovation activities need to be covered by the projects. At least 35% of the requested EC contribution should be allocated to the participating SMEs. Proposals not addressing this requirement will be considered ineligible. To ensure a larger industrial impact, priority will be given to proposals showing that the projects will be led by 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.

The following specific requirements will be reflected in the evaluation: (i) as regards the S/T quality & objectives, proposals should have holistic process chain lifecycle coverage with adaptive applications to different types of products and industrial sectors.

Expected impact: Microsystems-based products are considered an important contributor to Europe’s industrial and economic future with present (2005) market volume for Microsystems of EUR 31 billion/year, and predicted to double over 5 years.

Research output must show a clear strategic contribution to reaching targets of cost effective, automated and high quality manufacturing of new products with new features made possible from such integrated paradigms. The multidisciplinary effort will have to prove commercialisation capability and matching of deliverables to global regulatory requirements. The effective transfer and integration of laboratory scale manufacturing processes to an industrial environment is expected to contribute to the European Micro-Manufacturing industry capturing a 1/3 share of the world market.

II.4 Activity 4.4 Integration of technologies for industrial applications

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 specialized 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-2008-4.0-1 Development of nanotechnology-based systems for diagnosis and/or therapy for diabetes, musculo-skeletal or inflammatory diseases (in coordination with Theme HEALTH)

Technical content /scope: Within the objective of reinforcing the competitiveness of European industry addressing healthcare, proposals are called for with the aim of developing nanotechnology-based systems for diagnosis and/or therapy for diabetes, muscolo-skeletal or inflammatory diseases. Where meaningful, research should address the combination of diagnosis and therapy (theranostics) in multi purpose systems. They should demonstrate high specificity, efficacy and where appropriate biocompatibility. Linked animal testing should be kept to the minimum needed and should be replaced by in vitro testing wherever possible. This call addresses only human healthcare.

Funding scheme: Large-scale integrating collaborative projects.

Specific features: 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. Activities other than research could be included as appropriate, such as

specific education modules, pre- and co-normative activities, or the analysis of existing and required regulations. Gender issues should be considered, where appropriate.

Expected impact: (i) Better and more reliable diagnostics and/or therapy against present methods; (ii) delivery of improved health care to citizens and -where the case- also to livestock; (iii) increased competitiveness of European industry in this high value added and fast growing field.

NMP-2008-4.0-2 Catalysts and sustainable processes to produce liquid fuels from coal and natural gas

Technical content/scope: Diversification of raw materials in petrochemical production by the introduction of new processes based on natural gas or coal as raw materials will reduce the dependence on raw oil as well as improve the quality of the fuel and the efficiency of its use in subsequent processes. This would have benefits for our environment, stability of energy resources, safety and health. Research should focus on the design and development of innovative catalytic processes for the sustainable and environmentally benign production of transportation fuels and gasoline blending components. Approaches towards this goal could include engineered nanostructured catalysts with tailor-made and predictable properties (e.g. supported metals, oxides, biocatalysts) and novel reactor concepts (e.g. membrane reactors, short-residence-time reactors, microreactor devices). The projects should combine high-level materials science and application-oriented engineering through interdisciplinary partnerships that enable the mastering of highly catalytic complex processes. Engineering tools could involve innovative reaction media as well as catalyst design. In particular, an efficient combination of catalyst preparation, in-situ characterization, modelling and process engineering should demonstrate the feasibility of the most advantageous technologies.

Funding scheme: Large-scale integrating collaborative projects.

Specific features: 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. . To ensure a larger industrial impact, priority will be given to proposals showing a clear industrial leadership. This research area is particularly well suited for cooperation with Third Countries (e.g. United States, Russia, China, India, South Africa), which can help ensure a larger impact. Funding of Third Countries is in line with the rules of participation for FP7.

Expected impact: Diversification of raw materials in petrochemical production by the introduction of new processes based on natural gas or coal as raw materials will reduce the dependence on raw oil and the associated raw oil prices as well as improve the quality of the fuel and the efficiency of its use in subsequent processes. This would benefit our environment, safety and health, and stability of energy resources for society and our economy.

NMP-2008-4.0-3 Nano-technology enabled applications for integrated, cost-effective volume production

Technical content /scope: The aim is to develop production systems and associated assets derived from the most promising nano-technologies that can be integrated within existing or new industrial manufacturing applications for European industry. Priority is to be given to enabling nano-technologies that are mature enough to be integrated within existing or new production lines, with the highest potential to promote industrial application of nano-engineered products.

Specific focus will be on Nano-structured surfaces for the manufacturing equipment industry (both for the applications of nanosurfaces in their new equipment and for the production of nanosurfaces)

The objective is to develop production equipment, associated components and products that are characterised by highly functionalised nano-structured surfaces; that are defined as surfaces

containing at least one dimensional feature smaller than 100nm. Applications of nano-surfaces inside manufacturing equipment are driven by the need to avoid surface damage on the manufactured components, eliminate sources of contamination, reduce cleaning chemical consumption, and improve equipment reliability.

Targeted functionalities could be cleanliness, prevention of particle emission, efficiency against bacteria contamination, low chemical reactivity, wear resistance, high temperature applications, temperature sensing, wear monitoring, low damaging and sticking of soft material, optical resistance. Surface engineering should address different bulk materials such as alloys, advanced polymers, elastomers, ceramics and composites. The new properties caused by the nanosurfaces will lead to new features of the machine components and/or resulting products.

Processes may include coating processes such as self-organisation of surface molecules, specific manipulation, material removal or deposition as well as nano-scaled structuring of surfaces and solids. On line nano-surface functionality control has to be addressed, and should be supported by the co-development of appropriate quality measures, including surface characterization equipments and procedures, online control and online control systems. Deliverables should include material design ands engineering, process development and qualification, advanced design and engineering of production equipments, control systems of multifunctional environment and quality assurance.

Funding scheme: Large-scale integrating projects

Specific features: The following specific requirements will be reflected in the evaluation: (i) 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 (ii) to widen the industrial impact, proposals should ensure the involvement from the European Manufacturing equipment industry, involve all relevant end-user groups in the nano-micro-manufacturing value chain and demonstrate that proposed research maintain the strong position of this important industry.

Expected impact: The proposed research should show a clear strategic contribution to establishing a new European manufacturing industry fully exploiting the potential of the new nano-technology based processes and materials, including making these technologies industrially relevant by reducing their time and cost for integration.

Priority will be given to research that focuses on industrially mature enabling nano-technologies, integrating these within existing or new production lines, with the potential highest industry demand for manufacturing new, high-added value components and products with the most promising industrial and market potential.

Criteria of research output and deliverables will be based on targets related with the improvement of yield, reliability and throughput of the production equipments. Additional criteria will be the potential for reduction and prediction of equipment maintenance which guarantees the highest possible quality of manufactured components.

NMP-2008-4.0-4 Expanding the limits of advanced materials processing applications through a new generation of high brilliance lasers

***Technical content/scope*:** Although Europe today is the leader in industrial laser processing, continuous innovation and adoption of novel technologies is required to defend this position. For unleashing the full potential of photonics in industrial production, a closed development cycle consisting of beam source, process and quality assurance has to be established. Further improvement of existing and the development of new laser beam sources as well as related technologies (e.g. beam delivery and beam manipulation) must be pursued, leading to systems of industrial grade for tomorrow's demands. This also includes further development of materials used in laser beam sources and optical systems. The interplay between laser beam, material and the

surrounding atmosphere must also be understood. Finally, diagnostics must be incorporated for ensuring effective quality assurance for the process.

The main research challenges are: To expand the limits of advanced materials processing applications utilising laser technology; development of a new generation of low cost laser concepts with high brilliance, high efficiency and premium beam quality for industrial material processing applications.; development of optical-radiation-hard optical materials and functional tailored optical materials for improving the reliability of optical components. In addition, in order to integrate the above mentioned laser sources into material processing systems, suited beam delivery components and integrated advanced diagnostics are required.

Funding scheme: Large-scale integrating collaborative projects

Specific features: 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 following specific requirements will also be reflected in the evaluation: (i) as regards the S/T quality & objectives, the potential of the new generation laser system should be confirmed through application trials in processing of new materials or novel structures demonstrating also thorough understanding of the process behaviour; (ii) a further consideration for the S/T quality evaluation is that micro processing applications, as well as mature laser technologies, such as CO_2 and Nd:YAG laser sources are not considered a priority.

Expected impact: The availability of new laser sources and associated equipment is expected to stimulate the continued growth of the world market for laser materials processing systems (EUR 5 billion in 2005, 14% growth over the last decade), thus benefiting European laser manufacturers and systems integrators. For the end users in all sectors of manufacturing, robust laser sources & systems, which exhibit broad tolerance windows, better wall-plug efficiency and increased reliability; offer the possibility of new applications and improving the productivity of existing ones.

NMP-2008-4.0-5 Innovative concepts and processes for strategic mineral supply and for new high added value mineral-based products

Technical content/scope: The topic aims at increasing the European capability of sustainable mineral supply, and at creating new market opportunities through the development of new eco-efficient, high value added mineral particle based (industrial, construction and metallic minerals) products with enhanced and diversified functional properties.

The main development issues and targets that would enable realisation of increasing the European capability and high value added production of mineral products should cover:

- European mineral resource definition based on geological potential modelling of strategic supply;
- Pioneering applications with new groups of materials for industrial and end consumer products in light of new customer needs for tomorrow's markets;
- New strategies and technologies underlying transformation of metallic or non-metallic mineral resources;
- New mineral product functionality by intelligent modification of material properties and surfaces within micro-, macro- and nanoscale range adding significant value to the new end products;
- New strategies and technologies reducing the environmental footprint of mineral processing such as internal processing systems for re-use and recycle with closed material flows and quantitative use of all by-products with adapted process chains to generate additional life cycles.

Collectively the deliverables should form an integrated knowledge platform and proof of concept of novel large scale routes for the supply, engineering and manufacturing of new high added value mineral particle based products with better performance characteristics. Catalysts, absorbents, pigments etc. are among possible application areas but applications in high technology sectors, such as optical, electronics and space could also be considered.

Funding scheme: Large-scale integrating collaborative projects.

Specific features: 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 following specific requirements will be reflected in the evaluation: (i) to ensure appropriate exploitation of results, the proposals are expected to be industrially driven with significant demonstration, technology transfer, training and dissemination activities, which should benefit from initiatives of mineral sector and activate the mineral community across the EU; (ii) in addition, they should effectively integrate the key players of the supply chain throughout the product life cycle; (iii) concerning the S/T quality and objectives, point solutions, or partial solutions, e.g. proposals focussing on mineral processing or mineral engineering alone are excluded; (iv) the products for energy applications are not a priority for this call.

Expected impact: The new resource base and innovative products and materials should contribute towards a significant reduction of the EUR 11 billion trade deficit of the minerals sector; reduction of energy consumption by 5-10 % for major industrial operations; multiplication of application areas for mineral based products by up to 50%; and better use of mineral by-products by reducing processing wastes by 10-20%.

NMP-2008-4.0-6 Sustainable new products and markets through bioproduction of green forest-based chemicals and materials

Technical content/scope: Global competition decreases wood pulp prices by on average 1% per year. At the same time, the price of wood as a feedstock has become increasingly correlated with energy price. As a result, the European forest-based industry is loosing in profitability. However, the potential revenues from using wood for production of green chemicals, fuels and polymers can many times be higher than the revenues from the pulp itself. Upgrading the pulp and paper mills of today into the forest biorefineries of the future can potentially double revenues from forest-based materials while at the same time mitigate the green-house effect. Also the wood based industry is characterised by a well developed logistic chain for raw material, energy, power, water and the resulting products with which a stand alone biorefinery can not compete.

Further research activities should be directed towards functional materials and production technologies that are considered essential for the industry's effort to pursue the developments of products and markets characterised respectively by high added value and growth potential.

Main development issues and targets are:

- New process technology for adaptable production of side-stream chemicals from wood based feed stocks.
- Development of more selective and milder separation conditions or reactions, such as low temperature delignification, novel routes in sulphur and chlorine free pulping, and enzymatic processes, and separation by ionic liquids and supercritical fluids.
- Optimisation of thermo-chemical processes, such as steam explosion, pyrolysis and gasification for specific applications.
- Combinations of traditional technologies with bio- and nanotechnologies for the production of base chemicals.
- Development of new and selective isolation methods for various wood constituents (such as

lignin and hemicelluloses), based on high performance membrane technologies and chromatographic techniques.

Funding scheme: Large-scale integrating collaborative projects.

Specific features: 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 following specific requirements will also be reflected in the evaluation: (i) To ensure a wider industrial impact, significant industrial participation of key players from the whole supply chain is required, including industries and SMEs capable of implementing the new technologies; (ii) in this context, significant demonstration activities are foreseen, with the aim of establishing a pilot biorefinery plant, demonstrating flexibility of input and capability of processing a wide range of products. Synergies, coordination and collaboration with the KBBE thematic priority topics related to biorefineries, will be sought, where appropriate.

Expected impact

(1) Enabling European industry to within the next 10 years double its revenues from pulp production or similar production processes where wood is the main feed stock by efficient and adaptable extraction of high added value green chemicals, polymers and biofuels.

(2) Decrease Europe's dependency on fossil fuels for production of energy and chemicals.

(3) The commercialisation of advanced, zero-waste bio-refinery concept integrated with chemical pulp production.

(4) Increase utilisation of different forest residues such as bark and stubs that are not integrated with pulp production through similar processes

NMP-2008-4.0-7 Integration of new technologies and materials for differentiated consumer-centred product capability

Technical content/scope: The topic addresses the development and demonstration of new sustainable production capabilities for high added value consumer-centred product concepts and the conception and definition of industrial paradigms and infrastructures which relate to the relevant industry characterised by large numbers of SMEs exposed to global competition (for example, sporting goods and footwear). It aims to capitalise on new competitive strategies that demand product differentiation and personalisation to deliver high quality to individual consumers over a range of industrial sectors.

Comfort, health, welfare, affordability and sustainability are some of the quality and service-to-customer attributes to be targeted. The integrating effort should be based on the development of an engineering framework for both products & processes and products that combine new design and production technologies, new functional high-tech devices/components and new materials, for the complete satisfaction of consumer requirements/needs.

In particular, such key technical contents should be addressed as: innovative design tools and solutions dedicated (where appropriate) to personalised biomechanical and biomedical aspects; adaptive production processes and technologies guaranteeing quality, safety and health; micro and nano devices providing the product with innovative sensing and actuating functionalities, such as comfort, ease of use, control and modification of product properties; innovative high-performing materials with self-adaptive capabilities to optimally fit consumers physique and ergonomics, whilst guaranteeing comfort and aesthetic quality; emphasis on materials and production processes to achieve full eco sustainability of the product.

The expected outcomes of proposed projects will represent a technology framework for the engineering of such products (less than 15 days time-to-market criterion), whose features and technological contents will dramatically innovate the addressed industry sectors. New differentiated

consumer-centred products which should be delivered as fully engineered prototypes, including integrated demonstration actions of project results with new pilot factories.

Funding scheme*:* Collaborative projects targeted to SMEs.

Specific features: 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. SME dedicated collaborative projects are specifically designed to encourage SME participation in research and innovation representing the complete value added of the targeted sectors. Research and innovation activities need to be covered by the projects. At least 35% of the requested EC contribution should be allocated to the participating SMEs. Proposals not addressing this requirement will be considered ineligible. To ensure a larger industrial impact, priority will be given to proposals showing that the projects will be led by 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.)

Expected impact: Project outcomes are expected to impact the *high value added global market segment* for consumer goods with high-growth potential, thus representing a major challenge and opportunity for the European SME manufacturers in sectors such as footwear and sporting goods. The availability of affordable, personalised products should have a positive impact on the quality of life of consumers, in particular in comfort and health related applications. Advanced technologies and knowledge-based products will support the fight against counterfeiting and prevent relocation of activities to other areas of the world.

NMP-2008-4.0-8 Smart materials for applications in the sectors of construction and of machinery and production equipment

Technical content/scope: New materials (including related application oriented solutions) with improved physical or chemical properties, new functionalities and enhanced end user related properties are essential for innovation in the construction and machine building sectors. In the construction sector, areas where progress is needed include thermal, electro-magnetic and acoustic isolation, heat storage and climatic functionality, resistance against an aggressive environment, and inherent surface functionalities (e.g. hygienic and easy to clean, self-cleaning, biocides and/or moisture control properties). In the machinery sector, features expected from the novel materials are high damping capacity, vibration and noise reduction with high stiffness/mass ratio, and extremely high inherent thermal and long-term geometrical stability properties. The focus is on smart and multifunctional materials with good mechanical performance, both of the "active" type (with sensor-actuator coupling) and of the "passive type (with intrinsic self-adaptive or compensatory reaction to the change of external conditions), for use in the construction and/or machinery and production equipment industries. Proposals should lead to cost effective solutions and should contribute to achieving a reduced environmental impact and low energy and material resource consumption, in addition to considering issues such as recyclability. Developments are also expected to consider the efficiency of the related production processes, by innovation in manufacturing, control and process automation, in order to ensure quality while maintaining production flexibility. Research approaches should also take advantage of state-of–the-art knowledge from micro- and nano-technologies, biotechnologies, and sensor and information technologies. Research projects which are only relevant to aerospace, aeronautics, and/or automotive technologies are excluded.

Funding scheme: Collaborative projects targeted to SMEs.

Specific features: 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. SME dedicated collaborative projects are specifically designed to encourage SME participation in research and innovation representing the complete value added of the targeted sectors. Research and innovation activities need to be covered by the projects. At least 35% of the requested EC contribution should be allocated to the participating SMEs. Proposals not addressing this requirement will be considered ineligible. To ensure a larger industrial impact, priority will be given to proposals showing that the projects will be led by 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.)

Expected impact: New high added value construction and machine building materials, able to contribute to medium-term real innovation in these sectors. Contributions should also be made towards recyclability and reducing the environmental impact.

NMP-2008-4.0-9 Reducing the risk of injury in complex systems through advanced personal protective equipment

Technical content / scope: Driven by regulatory and performance considerations, a new generation of intelligent personal protective systems is needed to respond to the increasing societal concerns for personal safety and security in industrial (old and new) environments in Europe and beyond.

Projects should address entire system solutions for application areas such as work safety, construction, fire fighting, emergency operations and civil protection and be attuned to holistic industrial strategies of industrial risk minimisation and mitigation. The activities include the integration of state of the art materials, components and ICT solutions and the development of new speciality and high-performance protective materials and components such as technical textiles and smart materials, enhancing product multi-functionality. ICT solutions to be integrated include real-time risk monitoring systems for early detection of hazardous situations, soft computing and augmented reality techniques for training and for decision-supporting systems, data management, communication technologies and micro-electronic components (sensors, actuators). The research includes ergonomic design and usability tests of new products, such as clothing, reassuring operator's safety, comfort and high-level performance/productivity. Manufacturing concepts of the new products including prototyping and customisation should also be adequately addressed. Practicable normative solutions and support mechanisms in the form of pre-normative research and training are needed in order to avoid delays in translating new developments into generally used innovative products. In this sense the participating industry should define and implement a clear strategy of tackling regulatory and standardisation issues taking into account international cooperation in this area.

Funding scheme: Collaborative projects targeted to SMEs.

Specific Features: 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. SME dedicated collaborative projects are specifically designed to encourage SME participation in research and innovation representing the complete value added of the targeted sectors. Research and innovation activities need to be covered by the projects. At least 35% of the requested EC contribution should be allocated to the participating SMEs. Proposals not addressing this requirement will be considered ineligible. To ensure a larger industrial impact, priority will be given to proposals showing that the projects will be led by 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.)

The following specific requirements will be reflected in the evaluation: (i) the projects are expected to set up an engineering framework for the new product and process concepts.

The topic has to be considered as a necessary compliment to the previous NMP topic of 2007 for "Integrated risk management in Industrial systems".

Expected impact: The sector of personal protective equipment has an estimated annual turnover of EUR 7 to 8 billion. The strategy of performance driven development should lead to an expected growth of at least 50% in turnover in the sector of personal protective equipment (PPE) alone in real terms in the next 10 years. The development and integration of new technologies for advanced personal protective systems will lead to significant reduction of work-related accidents including emergency and rescue operations. As a result it is expected that occupational diseases and injuries related to working in hazardous environments are to be significantly reduced. It is expected that social losses will decrease; while workers satisfaction and societal welfare will benefit measured in terms of increased productivity and reduced absenteeism. The research should also reinforce European leadership in terms of quality and innovation of personal protective systems and contribute positively to the Lead Market Initiative in the domain[6].

NMP-2008-4.0-10 Organisation of events related to the Presidencies of the European Union

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 should contribute to new editions of past events (e.g. EuroNanoForum, Manufuture) or new events to be held in a Member State while having the Presidency of the European Union, namely France, the Czech Republic and Sweden, and thus, the active involvement of the competent National Authority(ies) will be necessary. It should address topics that are of high relevance at the date of its taking place. An appropriate equilibrium should be given to the proposed actions, with balanced presentation of various research and industrial elements and points of view. Participation of non-EU actors is possible. A press programme can also be included.

Funding scheme: Coordination and support actions aiming at supporting research activities.

Specific features: None. **Expected impact***:* (i) Review of research, industrial and/or societal developments linked to the industrial technologies-related issue to be covered; (ii) Sharing of information and comparison of points of views; (iii) support to the activity of various stakeholders: researchers, industrialists, investors, museums and/or schools.

NMP-2008-4.0-11 NCP trans-national activities

Technical content / scope: The National Contact Points (NCPs) play a key role in supporting the Commission in the implementation of the 7th FP and in providing potential participants with information and assistance services. In order to improve the cooperation among the NCPs and sharing good practices, Theme 4 (NMP) encourages trans-national cooperation activities including coordinated awareness campaigns, joint workshops, training, twinning schemes, partner-search and brokerage events.

Attention will also be given to helping less experienced NCPs (including appointed FP7 Contacts in third countries) rapidly acquire the know-how accumulated in other countries.

The Commission expects to receive a single proposal, involving all NCPs who have been officially appointed by the relevant national authorities. If certain NCPs wish to abstain from participating,

[6] Technical textile applications for intelligent personal protective clothing and equipment has been selected as one of the 6 domains in the Lead Market Initiative in which Europe demonstrates global leadership in innovation.

this fact should be explicitly documented in the proposal. Other, i.e. non-NCP participants from the EU and associated countries are ineligible

Funding scheme: Co-ordination and support action. This coordination action should be completed by March 2010**.** A maximum of 1 million Euros of EC funding will be allocated to this topic.

Specific features: To be eligible, the proposal must involve the officially appointed NCPs.

Expected impact:

- An improved NCP service across Europe, therefore helping simplify access to FP7 calls, lowering the entry barriers for newcomers, and raising the average quality of submitted proposals.
- An increased number of good quality proposals as well as of newcomers.

NMP 2008-4.0-12 Horizontal activities responding to emerging and policy needs in the context of ERA

Technical content/ scope: Achieving the ambitious technical, industrial and policy objectives assigned to the NMP programme requires the collective ability of the EC, of industry (especially through its involvement in the Technology Platforms) and of Member States' programmes to define, monitor and implement a coordinated set of initiatives :

- to improve synergies of efforts in the R& D field,
- to establish the necessary and timely links and actions with other important enabling factors influencing the successful implementation and social uptake of NMP technologies on the market place (eg through : availability of skilled human resources and of adequate training ; awareness raising ; anticipation of decision-makers in industry and in governments to prepare adequate and science-based frameworks and regulations etc)
- In this context, it is necessary to establish a shared basis of knowledge along the following priority areas:
  a) comparative evaluation scoreboard and performance indicators in NMP research activities between Europe and major third countries (especially USA, Japan, China) to monitor the implementation progress of European strategic initiatives in industrial technologies. Unique metrics is required for assessing the impact of new science in fields such as nano, materials and production technologies towards the key objectives of Theme 4, namely industrial transformation and sustainable production & consumption. More specifically, the support action is expected to develop an assessment methodology & progress indicators; to carry out data collection & analysis; and to provide an effective communication channel related to the implementation progress and contribution of relevant European strategic initiatives in industrial technologies towards the objectives of Theme 4. These strategic initiatives include, but are not limited to, the European Technology Platforms, Joint Technology Initiatives and Eureka. The developed methodology should be validated in a number of key industrial sectors within the project period.
  b) assessment of impacts induced by development of NMP technologies and by changing patterns of industry on skills and human resources, in order to anticipate skill and competence gaps, at research, engineering or manufacturing levels and to prepare proactive education, training and reskill schemes
  c) rapid availability of multi-disciplinary expertise on a European scale by using the resources of expert networks. The objective is to obtain fast and targeted advice, analysis and synthesis concerning emerging scientific, technological and industrial development of relevance to industrial technologies to help the EC improve its ability to assess strategic

developments, its capacity to react to them and to prepare adequate and timely initiatives to fulfil the objective of the NMP programme.

Funding scheme: Specific Support Actions aiming at supporting research activities

Specific features: A maximum of two projects will be funded under each one of the above sub-areas, with a maximum of EUR 150 000 of EC funding for each.

Expected impact*:* (i) proposal bringing added value to existing knowledge supporting decision making process; ii) production of recommendations and of practical measures of relevance to research and related policy agenda (as well as target measurement indicators wherever appropriate) supporting EC and MS decision-making procedures. (iii) support to actions and work of relevant stakeholders; (iv) support to the coordinated implementation and planning of ETPs' strategic agendas and roadmaps, throughout the Framework Programme and in synergy with Member States.

NMP-2008-4.0-13 ERA-NET on nanomedicine

Technical content/scope: The ERANET on nanomedicine aims at stepping up the coordination of research programmes in this promising and fast growing field. A step towards this aim is identifying RTD priorities in view of implementing joint initiatives, including joint calls with a clear focus on the interdisciplinary nature of nanomedicine as well as on the added value deriving from the cooperation at EU level.

Funding scheme: Coordination and support actions.

Specific features: See Annex 4. Only ERANET 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 and no two of which are established in the same Member or Associated State. Eligibility requirements are published in Annex 4.

Expected impact: (i) Improve coordination and reduce overlapping and fragmentation in the key fields of research of nanomedicine; (ii) achieve critical mass and ensure better use of limited resources in fields of mutual interests; (iii) share good practices in implementing research programmes; (iv) promote transnational collaborations and generate new knowledge.

NMP-2008-4.0-14 ERA-NET on trans-national cooperation for new innovative products in the forest-based value chains

Technical content/scope: The objective of this ERA-Net is to improve cooperation and coordination of the national research programmes in research areas related to the forest-based value chains, especially related to new and innovative production.

Funding scheme: Coordination and support actions

Specific features: See annex 4. Only ERANET 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 and no two of which are established in the same member or associated state. The participation of new Member States is particularly encouraged. Eligibility requirements are in Annex 4.

Expected impact: This activity is expected to reduce fragmentation by improved cooperation and set the basis for long-lasting cooperation and the promotion of a common European Research Area; to address in a coordinated way issues of common interests, whose socio-economic relevance is recognised at global level (such as: measurable energy savings from raw material optimization and

improved material properties of wood and fibres, creating higher added-value by sustainable processing of innovative products in different forest-based value chains); capitalise the experience of joint calls and coordinated activities with a view to setting up a trans-national European programme in the field, by for example the preparation of an Era-Net Plus.

NMP-2008-4.0-15 ERA-NET on implementing micro- and nano-manufacturing technologies within Member States industry

Technical Content/Scope : The objective of the ERA-Net is to improve cooperation and coordination of national research programmes with the objective to promote the rapid implementation of emerging Micro- and Nano- Technologies within Member State industries, hereby stimulating the creation of a new highly competitive industry, by facilitating the design, engineering and manufacturing of next generation high value-added products, exploiting the opportunities from integration and convergence of, for example, micro- ,nano-, bio-, info- and cognitive technologies.

The ERA-Net should target establishing a joint RTD programme between the involved Member States, focussing on RTD topic areas in response to existing European roadmaps, such as the µ-nano-Manufacturing roadmap, as well as common National priorities.

Funding scheme: ERA-NET / Coordination and support actions

Specific features: See annex 4. The ERA-NET must establish the operational strategy for cooperation, as well as the implementation procedures, based on a set of combined objectives and interests of the involved national programmes as well as the Community.

Involvement of new Member States and streamlining of ongoing ERA-NET activities with respect to procedures and contents should also be addressed.

Member State commitment, including the objective to have established a joint RTD programme latest by 2010, should be demonstrated.

Expected impact: The activity should show a clear strategic contribution to establishing a European micro- and nano-manufacturing industry in Europe.

It should increase synergies between National funding programmes, research organisations and industries, set the basis for long-lasting cooperation and result in an increased and more rapid uptake of new micro- and nano-technologies by the European manufacturing industry and in particular its SME's.

Experience from previous joint calls and coordinated activities should be exploited with a view to setting up a trans-national European programme in the field, by for example the preparation of an Era-Net Plus.

Specific features/ERA-Net: Only ERANET 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 and no two of which are established in the same member or associated state. The participation of new Member States is particularly encouraged. Eligibility requirements are annex 4.

PUBLIC PROCUREMENT IN 2008

(1) Specific contracts to be concluded under framework contracts launched in 2007

- **Project Technical Assistants (PTA)**

Subject: External assistance to enable detailed, prompt, pro-active, and scientifically competent follow-up by the Commission of ongoing NMP projects and NMP projects resulting from the calls for proposals in 2007

Contracts: in each of the 33 lots, up to 3 specific contracts starting in the first quarter of 2008 and for a duration corresponding with the duration of the projects covered

Budget: maximum EUR 2.970.000

- **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), possibly complemented by order forms

Budget: maximum EUR 450.000 in 2008

(2) New procurement procedures

- **Project Technical Assistants (PTA)**

Subject: External assistance to enable detailed, prompt, pro-active, and scientifically competent follow-up by the Commission of NMP projects resulting from the calls for proposals in 2008

Contracts: framework contracts implemented by specific contracts

Timing: first quarter of 2008

Budget: to be allocated in the 2009 work programme

- **Ex-post evaluation and impact assessment of RTD funding in the NMP area (1)***

Subject: Ex-post evaluation and impact assessment for (a sample of) completed NMP (FP6) projects

Contracts: 1 service contract for 2 years

Timing: first quarter of 2008

Budget: EUR 850.000

- **Ex-post evaluation and impact assessment of RTD funding in the NMP area (2)***

Subject: 4 separate longer term impact assessments of Community funding of research in certain areas / disciplines / sectors where a significant number of projects has been funded over the last decade (these areas could for example be: construction, machine tools, biomaterials, nanomaterials, nanomedicine)

Contracts: 4 contracts of 1 year

Timing: first quarter of 2008

Budget: EUR 300.000 (EUR 75.000 per contract)

- **Ex-post evaluation and impact assessment of RTD funding in the NMP area (3)***

Subject: External assistance to the detailed quantitative and qualitative analysis of the data produced by previous and current internal and external monitoring, evaluation and impact assessment exercises

Contracts: 1 contract of 3 years

Timing: first quarter of 2008

Budget: EUR 300.000

IV Implementation of calls 2008

IV.1 Budget (Million EUR): First calls closed in 2007

		2007	2008
1st calls			
	Large scale integrating collaborative projects	**200.000**	**95**
	Small or medium scale focused research projects	**105.723**	**45**
	SME-targeted projects	**44.000**	**31**
	CSA (Coordination and support actions)	**15.000** *of which up to EUR 2.5 million to be allocated to topic:* ***NMP-2007-4-7 ERANET on Construction,*** *which is implemented via a joint call as detailed in Annex 4.*	**--**
	ERANET		
	ERANET Plus ***		**8**
Other activities	*- Evaluation (3.50)* *- Calls for tenders (1.550)*	**5.050**	
General Activities (see Annex 4)	*- Cordis (0.787)* *- Eureka/ research organisations (0.090)* *- Cost (3.376)* *- ERANET (7.096)* *RSFF****	**11.35**	
TOTAL		**381.123**	**179**

*** *ERANET Plus implemented via a joint call as detailed in Annex 4.*

**** An amount of EUR 18.140 million was transferred during 2007 to the RSFF budget line

IV.2 Indicative budget* (Million EUR): Second calls

		2008**
2nd calls	Large scale integrating collaborative projects	**60.000**
	Small or medium scale focused research projects	**100.993**
	SME-targeted projects	**4.855**
	CSA (Coordination and support actions)	**15.000**
	Joint Call with Energy	**10.000**
	Joint call with Environment	**5.000**
	Coordinated call with India	**5.000**
	ERANET ***	
	ERANET Plus ***	
	Total	**200.848**
Other activities	*- Evaluation (3.5)* *- Calls for tenders (4.870)* *- IMS Secretariat - Art. 108(2)(d) Financial Regulation (0.140)*	**8.510**
General Activities (see Annex 4)	*- Cordis (0.754)* *- Eureka/Research organisations (0.032)* *- Cost (3.231)* *-ERANET (2.047)*	**6.064**
TOTAL		**215.422**

** An amount for the 2009 budget is expected to be added to these calls for which a new financing decision to cover the budget for that year will be requested at the appropriate time.*
*** Under the condition that the preliminary draft budget for 2008 is adopted without modifications by the budgetary authority.*

*******ERANET and*** *ERANET Plus* ***projects*** *are implemented via a joint call as detailed in Annex 4.*

IV.2 Calls for proposals NMP-2008

- **Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies**
- **Call identifier**: ***FP7-NMP-2008-LARGE-2***
- **Date of publication**: 30 November 2007[7]
- **Deadline**: For Large scale integrating collaborative projects - first stage: 6 March 2008 at 17.00.00 (Brussels local time)[8]
- **Indicative budget: EUR 60 million in 2008[9].** An amount for the 2009 budget is expected to be added to this call for which a new financing decision to cover the budget for that year will be requested at the appropriate time[10].
- **Topics called**:

Activity/ Area	Topics called	Funding Schemes
Nanotechnologies and converging technologies	**NMP-2008-1.2-1 Pilot lines to introduce nanotechnology-based processes into the value chain of existing industries**	Large scale integrating collaborative projects
Health and Environmental Impacts	**NMP-2008-1.3-1 Validation, adaptation and/or development of risk-assessment methodology for engineered nanoparticles**	
Knowledge-based smart materials with tailored properties	**NMP-2008-2.2-1 Compound semiconductors for electronics and photonics**	
Advances in chemical technologies and materials processing	**NMP-2008-2.4-1 Inorganic-organic hybrid materials**	
Adaptive production systems	**NMP-2008-3.2-1 Implementation of process intensification strategies in industrial scale**	
Rapid transfer and integration of new technologies into the design and operation of manufacturing processes	**NMP-2008-3.4-1 Rapid design and virtual prototyping of factories**	
	NMP-2008-3.4-2 Industrialisation through new integrated construction processes	
Integration of technologies for industrial applications	***NMP-2008*- 4.0-1 Development of nanotechnology-based systems for diagnosis and/or therapy for diabetes, muscolo-skeletal or inflammatory diseases**	
	NMP-2008-4.0-2 Catalysts and sustainable processes to produce liquid fuels from coal and natural gas	

[7] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.
[8] At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months

[9] Under the condition that the preliminary draft budget for 2008 is adopted without modifications by the budgetary authority.
[10] In addition, the final budget awarded to this call, following the evaluation of projects, may vary by up to 10% of the total value of the call.

	NMP-2008-4.0-3 Nano-technology enabled applications for integrated, cost-effective volume production -	
	NMP-2008-4.0-4 Expanding the limits of advanced materials processing applications through a new generation of high brilliance lasers	
	NMP-2008-4.0-5 Innovative concepts and processes for strategic mineral supply and new high added value mineral-based products	
	NMP-2008-4.0-6 Sustainable new products and markets through bioproduction of green forest-based chemicals and materials	

- **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 (font size 12) 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. It 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: 23 September 2008.
- **Indicative evaluation and contractual timetable**: Evaluation Stage 1 proposals: End of March/beginning of April 2008; Evaluation stage 2 proposals: October 2008. Evaluation results: estimated to be available within two months after the closure date. A reserve list of projects might be established.
- **Consortia agreements**: Participants are required to conclude a consortium agreement.
- **Particular requirements for participation, evaluation and implementation:**

  The minimum number of participating legal entities for all funding schemes is set out in the Rules for Participation.

  For large scale integrating projects the minimum EC funding requested **must be greater than EUR 4 million**.

  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 line with the objectives of each topic, additional eligibility or evaluation criteria may be indicated under "Specific Features" in the Work Programme.

  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**

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

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

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

- **Call identifier**: ***FP7-NMP-2008-SMALL-2***
- **Date of publication**: 30 November 2007[11]
- **Deadline:** For Small or medium-scale focused research projects - first stage: 6 March 2008 at 17.00.00 (Brussels local time)[12]
- **Indicative budget: EUR 100,993 million in 2008[13]**. An amount for the 2009 budget is expected to be added to this call for which a new financing decision to cover the budget for that year will be requested at the appropriate time[14].
- **Topics called**:

Activity/ Area	Topics called	Funding Schemes
Nanosciences and converging sciences	**NMP-2008-1.1-1Converging sciences and technologies (nano, bio, info, cogni)**	**Small or medium-scale focused research projects**
Nanotechnologies and converging technologies	***NMP-2008*-1.2-3 Development of technologies for the controlled combustion of nano-particles**	
Health and Environmental Impacts	**NMP-2008-1.3-2 Impact of engineered nanoparticles on health and the environment**	
Mastering nano-scale complexity in materials	**NMP-2008-2.1-1 Nano-structured membrane materials**	
	NMP-2008-2.1-2 Processing and upscaling of nano-structured materials	
Knowledge-based smart materials with tailored properties	**NMP-2008-2.2-2 Nano-structured meta-materials**	
Novel material and bio-inspired materials	**NMP-2008-2.3-1 Advanced implants and bioactive materials for critical organs**	
Advances in chemical technologies and materials processing	**NMP-2008- 2.4-2 Radical advances in the processing of multifunctional films and tapes**	
Using engineering to develop high performance knowledge-based materials	**NMP-2008-2.5-1 Functionally graded materials for improved mechanical performance**	
	NMP-2008-2.5-2 Modelling of interfaces for high performance materials design	

[11] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.
[12] At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months.
[13] Under the condition that the preliminary draft budget for 2008 is adopted without modifications by the budgetary authority.

[14] In addition, the final budget awarded to this call, following the evaluation of projects, may vary by up to 10% of the total value of the call.

Adaptive production systems	**NMP-2008-3.2-2 Self-learning production systems**	
Networked production	**NMP-2008-3.3-1 Supply chain integration and real time decision making in non hierarchical manufacturing networks**	

- **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 (font size 12) 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. It 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 2 September 2008.
- **Indicative evaluation and contractual timetable:** Evaluation Stage 1 proposals: End of March/beginning of April 2008; Evaluation stage 2 proposals: September 2008. Evaluation results: estimated to be available within two months after the closure date. A reserve list of projects might be established.
- **Consortia agreements**: Participants are required to conclude a consortium agreement.
- **Particular requirements for participation, evaluation and implementation**.

  The minimum number of participating legal entities for all funding schemes is set out in the Rules for Participation.

  For the small or medium scale focussed research projects the **maximum** EC funding requested **must not exceed** EUR **4 million**.

  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 (This does not apply for topics: **NMP-2008- 4.1.1-1Converging sciences and technologies (nano, bio, info, cogni)** and **NMP-2008-4.1.3-2 (Risk assessment) Impact of engineered nanoparticles on health and the environment).**
  In line with the objectives of each topic, additional eligibility or evaluation criteria may be indicated under "Specific Features" in the Work Programme

  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

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

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

- **Call identifier**: ***FP7-NMP-2008-SME-2***
- **Date of publication**: 30 November 2007[15]
- **Deadline**: For Collaborative projects targeted to SMEs - first stage: 6 March 2008 at 17.00.00 (Brussels local time)[16]
- **Indicative budget: EUR 4.855 million in 2008[17]**. An amount for the 2009 budget is expected to be added to this call for which a new financing decision to cover the budget for that year will be requested at the appropriate time[18].
- **Topics called**:

Activity/ Area	Topics called	Funding Schemes
Development and validation of new industrial models and strategies	**NMP-2008- 3.1-1 Transformation strategies for SMEs in turbulent global market environments - SMEs**	Collaborative projects targeted to SME
Exploitation of the convergence of technologies	**NMP-2008-3.5-1 Volume production process chains for high throughput micro-manufacturing**	
Integration of technologies for industrial applications	**NMP-2008-4.0-7 Integration of new technologies and materials for differentiated consumer-centred product capability**	
	NMP-2008-4.0-8 Smart materials for applications in the sectors of construction and of machinery and production equipment	
	***NMP-2008*-4.0-9 Reducing the risk of injury in complex systems through advanced personal protective equipment**	

- **Evaluation procedure**: For SME -targeted projects the evaluation shall follow a two-stage procedure. The first stage proposal, of a maximum of 10 pages (font size 12) 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. It 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: 23 September 2008.

[15] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.
[16] At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months.
[17] Under the condition that the preliminary draft budget for 2008 is adopted without modifications by the budgetary authority.

[18] In addition, the final budget awarded to this call, following the evaluation of projects, may vary by up to 10% of the total value of the call.

- **Indicative evaluation and contractual timetable**: Evaluation Stage 1 proposals: End of March/beginning of April 2008; Evaluation stage 2 proposals: October 2008. Evaluation results: estimated to be available within two months after the closure date. A reserve list of projects might be established.

- **Consortia agreements**: Participants are required to conclude a consortium agreement.

- **Particular requirements for participation, evaluation and implementation**:

  The minimum number of participating legal entities for all funding schemes is set out in the Rules for Participation.

  For a proposal to be eligible, At least 35% of the requested EC contribution will be allocated to the participating SMEs. This is an eligibility criterion,

  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 SME targeted projects **no upper or lower limits** in EC contribution are applied.

  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

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

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

- **Call identifier**: ***FP7-NMP-2008-CSA-2***
- **Date of publication**: 30 November 2007[19]
- **Deadline**: For Coordination and Support Actions: 24 April 2008 at 17.00.00 (Brussels local time)[20]
- **Indicative budget: EUR 15 million in 2008[21].**
- **Topics called**:

Activity/ Area	Topics called	Funding Schemes
Nanosciences and converging sciences	**NMP-2008-1.1-2 Support to outreach and communication in nanotechnology**	Coordination and supporting actions (CSAs**)**
	NMP-2008-1.1-3 Examining capacity building in nanobiotechnology	
Nanotechnologies and converging technologies	**NMP-2008-1.2-4 Study about best practices for IPR and license agreements for collaborative research and technological development projects in nano- and converging technologies**	
Coordinated activities and international cooperation	**NMP-2008-2.6-3 Coordinated actions with Materials researchers in major world regions**	
Adaptive production systems	**NMP-2008-3.2-3 Strategy for inter-regional manufacturing communities following IMS strategy update**	
Integration of technologies for industrial applications	**NMP-2008-4.0-10 Organisation of events related to the Presidencies of the EU**	
	NMP-2008-4.0-11 NCP transnational activities	
	NMP-2008-4.0-12 Horizontal activities responding to emerging and policy needs in the context of ERA	

- **Evaluation procedure**: For Coordination and support actions the evaluation shall follow a single stage procedure.
- **Indicative evaluation and contractual timetable**: Evaluation: End May. Evaluation results: estimated to be available within two months after the closure date. A reserve list of projects might be established.
- **Consortia agreements**: Participants are encouraged but not required to conclude a consortium agreement.

[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] At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months.
[21] Under the condition that the preliminary draft budget for 2008 is adopted without modifications by the budgetary authority. In addition, the final budget awarded to this call, following the evaluation of projects, may vary by up to 10% of the total value of the call.

- **Particular requirements for participation, evaluation and implementation**:

  The evaluation criteria (including weights and thresholds) and subcriteria together with the eligibility, selection and award criteria to be applied to Coordination and Support Actions under this call are given in Annex 2.

  The following topics have specific eligibility criteria:

  - **NMP-2008-3.2.3:** the consortia must involve partners at least from two other IMS countries/regions.

  - **NMP-2008-4.0-10**: the active involvement of the National Authorities concerned is required.

  - **NMP- 2008- 4.0.11**: To be eligible the proposal must involve the officially appointed NCPs.

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

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies and Theme ENVIRONMENT (including Climate Change)

- **Call identifier**: FP7-ENV-NMP-2008-2
- **Date of publication**: 30 November 2007[22]
- **Deadline:** 25 February 2008 at 17.00.00, Brussels local time[23]
- **Total budget**: 10 million EUR of which EUR 5 million from Theme 4 – NMP in 2008[24] and EUR 5 million from Theme 6 – Environment (including Climate Change). All budgetary figures given in this call are indicative[25].

- **Topic called**

THEME/ ACTIVITY	TOPIC IDENTIFIER	FUNDING SCHEME
ENV.2008.3.1.1.2	***Nanotechnologies for water treatment***	***Collaborative projects (small or medium-scale focused research projects)***
NMP.2008.4.1.2-2		

This topic is implemented jointly with Theme 6 – Environment (including Climate Change), hence each proposal must be submitted only **once,** either to topic NMP-2008-4.1.2-2 or to topic ENV.2008.3.1.1.2, **but not to both.**

- **Evaluation procedure:**
  - A one-stage submission procedure will be followed.
  - Proposals may be evaluated remotely.
  - The evaluation criteria (including thresholds) and sub-criteria together with the eligibility, selection and aware criteria for the different funding schemes are set out in annex 2 to this work programme.
  - An additional eligibility criterion is the budgetary threshold. Under this topic, the requested Community contribution shall not exceed EUR **2.5 million**.

- **Indicative evaluation and contractual timetable:**
  Evaluations are expected to be carried out during the months of March-April 2008. It is expected that the contract negotiations for the short-listed proposals will be opened in June 2008.

- **Consortia agreements**: Participants are required to conclude a consortium agreement.

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

- **Particular requirements for participation, evaluation and implementation:**
  The minimum number of participating legal entities for this funding scheme is set out in the Rules for Participation.

[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] At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months.

[24] Under the condition that the preliminary draft budget for 2008 is adopted without modifications by the budgetary authority.

[25] In addition, the final budget awarded to this call, following the evaluation of projects, may vary by up to 10% of the total value of the call.

Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies and Theme 5 Energy

Call identifier: FP7-Energy -NMP-2008-1

Date of publication: 30 November 2007[26]

Deadline: 26 February 2008[27] at 17.00.00, Brussels local time.

Indicative budget [28]*: EUR 25* million from the 2008[29] budget (of which EUR 10 million from Theme 4 - NMP and EUR 15 million from Theme 5 - Energy)[30]

Topics called:

Activity/ Area	Topics called	Funding Schemes
ENERGY.2008.10.1.2	Novel materials for energy applications	Collaborative Project
NMP-2008-2.6-1		

Evaluation procedure:

The evaluation shall follow a two stages procedure. The first stage proposal, of a maximum of 10 pages (A4 page - font size 12, 2cm margins) 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.

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: 6 May 2008.

Indicative evaluation and contractual timetable:
Evaluation Stage 1 proposals: February/March 2008
Evaluation stage 2 proposals: May/June 2008. Evaluation results: estimated to be available within two months after the closure date. A reserve list of projects might be established.

Consortia agreements: Participants in Collaborative Projects are required to conclude a consortium agreement.

Particular requirements for participation, evaluation and implementation:

The minimum number of participating legal entities for all funding schemes is set out in the Rules for Participation. Collaborative Projects (small or medium scale focused projects) under this call the maximum requested EC contribution must not exceed EUR 3 million. This is an eligibility criterion – proposals above this limit will not be evaluated.

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

Evaluation criteria and thresholds for stage 1 proposals:

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

[27] At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months.

[29] Under the condition that the preliminary draft budget for 2008 is adopted without modifications by the budgetary authority.

[30] In addition, the final budget awarded to this call, following the evaluation of projects, may vary by up to 10% of the total value of the call.

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**

The evaluation criteria and subcriteria, together with the eligibility, selection and award criteria, for the different funding schemes are set out in Annex 2 to this work programme.

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

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

- **Call identifier:** ***FP7-NMP-2008-EU-India-2***[31]
- **Date of publication**: 30 November 2007 [32]

  Deadline: For collaborative projects - Small or medium-scale focused research projects - 24 April 2008 at 17.00.00 (Brussels local time).
- **Indicative budget: EUR** 5 Million in 2008[33] by EC- NMP Theme (a similar budget for the call is expected from DST). [34]

- **Topic called**:

Activity/ Area	Topic called	Funding Scheme
Coordinated activities and international cooperation	**NMP-2008-2.6-2 Computational material science**	Small or medium scale focused research projects

- **Indicative evaluation and contractual timetable**

Evaluation: June 2008; Evaluation results: estimated to be available within two months after the closure date. A reserve list of projects might be established. Negotiations will be carried out in parallel by the EC and DST, in order to have a simultaneous start of the respective grant agreements.

- **Consortia agreements**

Participants in the EC project are required to conclude a consortium agreement with the participants in the coordinated project funded by the DST. A final draft has to be provided with the proposal.

- **Additional eligibility criteria**

The eligibility, selection and award criteria to be applied to this Coordinated call are given in Annex 2 of this work programme. Proposals which do not include coordination with an Indian project will be considered ineligible. Therefore, the EC project proposals must include detailed explanations about the proposal to be financed by the DST.

Project proposals will only be evaluated on the condition that the proposal related to their coordinated Indian project has also been presented for funding to the DST. For information the deadline for submission of Indian projects to DST is fixed at 24 April 2008 at 20.30.00 hrs (India local time).

In addition, for each project, the maximum EC funding requested must not exceed **EUR 1 million.**

- **Evaluation procedure**

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

[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] At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months

[33] Under the condition that the preliminary draft budget for 2008 is adopted without modifications by the budgetary authority.

[34] In addition, the final budget awarded to this call, following the evaluation of projects, may vary by up to 10% of the total value of the call.

- **Evaluation criteria and thresholds**

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

The 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**

To ensure a project implementation that reflects a more genuine EU-India cooperation, in evaluation priority will be given to proposals showing a balanced effort between the two coordinated projects and where the research plan involves properly coordinated research activities between Europe and India. The proposals should also take into account the exchange of researchers.

- **Additional selection criterion**

Project proposals will only be selected on the condition that their coordinated Indian project is also selected for funding by the DST.

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

ERANET and ERANET Plus topics

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

Activity/ Area	Topics called
ERA-NET Plus	**NMP-2008- 2.6-4 ERANET Plus on Materials Research**
ERA-NET	**NMP-2008- 4.0-13 ERA-NET on Nanomedicine**
	NMP-2008-4.0-14 ERA-NET on trans-national cooperation for new innovative products in the forest-based value chains
	NMP-2008-4.0-15 ERA-NET on implementing micro- and nano-manufacturing technologies within Member States industry