



THE SIXTH FRAMEWORK PROGRAMME

The Sixth Framework Programme covers Community activities in the field of research, technological development and demonstration (RTD) for the period 2002 to 2006

"Integrating and strengthening the European Research Area"

THEMATIC AREA 3

Nanotechnology and nanosciences, knowledge-based multifunctional materials,
new production processes and devices

WORK PROGRAMME

Edition December 2004

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3.1. General Introduction

1. General

Following the adoption of the specific programme for research, technological development and demonstration: "Integrating and strengthening the European Research Area"¹ and the rules of participation and dissemination² under the EC Treaty, the Commission adopted and updated as appropriate, with the assistance of the programme committee, this work programme which sets out in greater detail the objectives and technological priorities and the timetable for implementation of the specific programme.

As regards the **Priority Thematic Areas of Research**, integrated projects and networks of excellence are recognised as being an overall priority means to attain the objectives of critical mass, integration of the research capacities, management simplification and European added value.

These instruments are being used in each theme and, where deemed appropriate, as a priority means, while maintaining the use of specific targeted projects and co-ordination actions.

In terms of participation of the Community in programmes undertaken by several Member States (Article 169 of the Treaty), this is only foreseen, at this stage, in the priority thematic area of research addressing 'Life sciences, genomics and biotechnology for health'.

More information on the provisions for implementing the new instruments (integrated projects and networks of excellence) is available on Cordis (<http://www.cordis.lu/fp6/instruments.htm>).

Regarding research activities in areas involving Specific Activities Covering a Wider Field of Research, these are being implemented, at this stage, using specific targeted research projects, co-ordination actions, and specific research projects for small and medium sized enterprises (SMEs).

Concerning Strengthening the Foundations of the European Research Area, the implementation is mostly done through specific targeted research projects, specific support actions, and co-ordination actions.

Specific support actions, including calls for tender, and co-ordination actions may be applied throughout the programme.

In updating this work programme, the Commission has relied on advice mainly from advisory groups. More information on the list of members of the advisory groups is available on Cordis. These groups of independent high-level experts have been set up to advise on the implementation of Community research policy. The experts are renowned for their knowledge, skills and top-level experience in the field or regarding the issues to be dealt with by the groups.

2. Scope of Work Programme

The scope of this work programme corresponds to that defined in the specific programme. The calls for proposals planned within this work programme are those foreseen to close in 2004 and 2005 along with, in many cases, an indication of those calls intended to close in 2006. Annex A gives an overview of these calls.

3. Cross Cutting Issues

There are several issues that are important to all parts of the work programme. These are addressed here and, as appropriate, elaborated in the various parts. Please note that the work related to statistics

¹ OJ L 294, 29.10.2002, p. 1.

² OJ L 355, 30.12.2002, p. 23.

in this work programme will be implemented in close co-operation with EUROSTAT, in particular the parts relating to the priority thematic areas “Information society technologies” and “Citizens and governance in a knowledge-based society”, as well as the part addressing policy-oriented research under the heading “Specific activities covering a wider field of research”.

- a) This work programme places special emphasis on the needs of small and medium-sized enterprises (SMEs). In particular, at least 15% of the funding allocated to the Priority Thematic Areas of Research is foreseen for SMEs. In order to reach this objective, special actions are foreseen such as SME specific calls for proposals in the context of the new instruments, reinforcement of National Contact Points, and specific training and take-up measures. In addition, the involvement of SMEs is taken into account in the evaluation criteria particularly for the new instruments. Also the fact that enterprise groupings which represent large communities of SMEs may play an active role in the new instruments will contribute to reaching the above-mentioned objective.
- b) Proposers based in Associated States may take part in this programme on the same footing and with the same rights and obligations as those based in Member States. In addition, this work programme underlines the importance of involving associated candidate countries in the Community's research policy and in the European Research Area. Further specific support actions will also be implemented to stimulate, encourage and facilitate the participation of organisations from the remaining candidate countries in the activities of the priority thematic areas. Annex D provides details of these specific measures (in particular that relate to the reinforcement of the Associated Candidate Countries research capacities).
- c) International co-operation represents an important dimension of the Sixth Framework Programme. As a contribution to a European Research Area open to the world, it will be implemented in the Sixth Framework Programme through three major routes:
 - The opening of “Focusing and Integrating Community Research” to third country organisations with substantial funding,
 - Specific measures in support of international co-operation, and
 - International activities under the heading of Human Resources in the specific programme for research, technological development and demonstration “structuring the European Research Area”.

The first two, as part of the specific programme “Integrating and strengthening the European Research Area”, are covered by the present work programme. They also correspond to the second activity referred to in Article 164 of the Treaty, which covers co-operation with third countries and international organisations.

- *Opening of “Focusing and Integrating Community Research” to third country organisations*

Funding is available for the participation of researchers, teams and institutions from third countries in projects within the seven Priority Thematic Areas of Research, as well as under “Specific activities covering a wider field of research”. Under this heading, the activities in question have the following overall objectives:

- To help European researchers, businesses and research organisations in the European Union and in the countries associated with the Framework programme to have access to knowledge and expertise existing elsewhere in the world, and
- To help ensure Europe’s strong and coherent participation in the research initiatives conducted at international level in order to push back the boundaries of knowledge or help to resolve the major global issues.

Any particular issue concerning the international dimension of the seven Priority Thematic Areas of Research and of the Specific activities concerning a wider field of research is set out in the relevant chapter of this work programme. Annex E on the other hand provides details on the

specific measures that are envisaged for the promotion of co-operation with targeted third countries.

Participants from all third countries³ and from international organisations may take part in all activities under this heading in addition to the minimum number of participants required.

Participants from developing countries, Mediterranean partner countries, Western Balkan countries, as well as Russia and the new independent states (see the list of countries in Annex C) can be funded in all activities under this heading⁴. Other third country participants can also be funded in those areas where the relevant part of this work programme makes reference to this possibility or if it is essential for carrying out the research activity.

- *Specific measures in support of international co-operation*

315 million Euro will fund “Specific measures in support of international co-operation”. In support of the external relations, including the development policy, of the Community, these measures target the following groups of third countries: Developing countries, Mediterranean partner countries, Western Balkan countries, and Russia and the new independent states. The activities and calls for proposals under this heading, which are complementary to the opening of the Priority Thematic Areas of Research, are presented in Chapter 10 of this work programme. Requirements for consortium composition are set out in this part.

- *Participation and funding for third country entities under the heading “Strengthening the European Research Area”*

International co-operation with third country partners and international organisations will be actively fostered on all topics which will benefit from such co-operation. Furthermore, third country entities and international organisations can benefit from Community financial contribution. To this end, topics for international co-operation will be specified, where appropriate, in calls. This applies particularly to those third countries with whom co-operation agreements have been concluded. As mentioned above, Annex E provides details on the specific measures that are envisaged for the promotion of co-operation with targeted third countries.

- d) Research activities carried out under this work programme must respect fundamental ethical principles and the requirements as stipulated in the decision on the specific programme for research, technological development and demonstration: “Integrating and strengthening the European Research Area”. More information on the review procedure is foreseen in the “Guidelines on Proposal Evaluation and Project Selection Procedures” (<http://www.cordis.lu/fp6/eval-guidelines>). Annex B to this work programme also details the issues to be covered in any ethical review.
- e) As much as possible and in association with the specific programme for research, technological development and demonstration “Structuring the European Research Area”, the mobility of researchers will be promoted, particularly with a view to the successful creation of the European Research Area.
- f) This work programme attempts, where possible, to reinforce and increase the place and role of women in science and research both from the perspective of equal opportunities and gender relevance of the topics covered.
- g) A particular effort will be carried out to take into consideration the ethical, social, legal, regulatory and wider cultural aspects of the research including socio-economic research, and innovation, resulting from the possible deployment, use and effects of the newly developed technologies or processes and scenarios covered by each of the thematic priorities. This effort

³ Please check on Cordis for further details, including regularly updated information.

⁴ 285 million euro has in fact been allocated for participation from the targeted third countries (see Annex C) within the Priority Thematic Areas of Research and specific activities covering a wider field of research.

will be complemented by socio-economic research carried out within the priority addressing ‘Citizens and governance in a knowledge-based society’.

- h) In the context of the regular report to be submitted to the European Parliament and the Council, the Commission will continue to report in detail on progress in implementing the specific programme, and, in particular, progress towards achieving its objectives and meeting its priorities.
- i) The promotion of innovation is a cross-cutting issue, relevant to the whole European Community RTD Framework Programme. This issue aims to meet the Treaty objective of strengthening the scientific and technological bases of Community industry *and encouraging it to become more competitive at international level*⁵.

In this context, an important goal is to promote exploitation of the results of those projects which include R&D components⁶. To this end, consortia should pay sufficient attention to the management of knowledge and pursuit of innovation in their projects. These issues should be well integrated in the proposals through the work content and consortium composition, and will be taken into account during their evaluation⁷. Projects should involve, where appropriate, end-users and other stakeholders to ensure relevance of the research and effective take-up of results.

In particular, the participants should include in their projects “innovation-related activities”, that may be supported by EC funding. Examples of such activities include the protection and management of knowledge and intellectual property, the analysis of socio-economic factors affecting the exploitation of the project's results, feasibility studies for the creation of spin-offs, and other activities to promote knowledge transfer between public research and industry.

During a project, the participants will be requested to report periodically on these issues, in particular by developing and updating throughout the project a *plan for using and disseminating the knowledge*. This plan should describe the innovation-related activities already implemented and those being planned, as well as their actual or expected impact.

Besides these central project-level activities, specific mechanisms will ensure that there is exchange of information and experience between the activities of the different work programmes as regards their innovation dimension, and that the innovation-related achievements be properly analysed, monitored, and evaluated⁸.

4. Submitting a Proposal

Proposals should be submitted under the terms of a call for proposals⁹. In order to submit a proposal, a proposer should consult the following:

- This work programme,
- The relevant call for proposals as it is published in the *Official Journal of the European Union*, and
- The relevant Guide for Proposers.

⁵ EC Treaty, Art. 163.1

⁶ As confirmed in the Council decision of 30.9.2002 relating to the specific RTD programme for “Integrating and strengthening the European Research Area” (Annex, section 1.1 – OJ L 294/7)

⁷ As stated in Art. 10.1.e of the rules of participation (OJ L 355/28)

⁸ cf. OJ L 294/50, section 2.f of the Annex

⁹ Proposals for specific support actions, which do not fall within the scope of a call for proposals, may be submitted to the Commission only when it is provided for in this work programme.

These and a number of other useful texts, including the rules for participation and details on the contracts, are available on Cordis (as referred to above).

5. Cross Cutting Proposals

Proposals are invited to be submitted on the basis of calls for proposals, which are, in the case of the Priority Thematic Areas of Research organised thematically. Proposals that address more than one thematic area will be accommodated by the Commission, provided the proposal addresses areas covered by this work programme.

The specific programme is focused on a number of thematic priorities. They encompass a wide range of disciplines and proposals that cut across the boundaries of themes are to be expected. The criterion of relevance to the objectives of the specific programme is a *sine qua non* for the further consideration of such proposals. Furthermore, proposals will not be accepted if they do not fall within the scope of the work programme.

Cross-cutting proposals may be categorised as follows:

- **Proposals with a clear “centre of gravity”.** Given the nature of research carried out today, a large proportion of proposals contain some degree of multi-disciplinarity. These are handled by normal submission and evaluation procedures. For proposals which contain a significant technological or thematic element from a different part of the programme, the procedure involves the proposal being treated by the thematic area represented by the greatest proportion of the proposal (ie, its “centre of gravity”). For proposals where the centre of gravity is not immediately obvious, the Commission will examine the proposal content and decide in which thematic area the proposal is best handled. If a proposal is transferred to a thematic area other than the one to which it was submitted, it will be handled in the framework of the new thematic area. However, if the new centre of gravity does not have an open call at the time of transfer, the proposal will be held over, with the agreement of the proposers, until a suitable call is open, but only if such a call is explicitly foreseen by the work programme. If successful, the proposal will be handled and funded by the thematic centre of gravity.
- **Joint calls for proposals.** In certain fields, it is clear that proposals will always contain a high proportion of interest for different thematic areas. In this instance, the Commission uses calls for proposals issued jointly by two or more programme/thematic areas, with a pooling of budget. This procedure only occurs for well-defined areas where the cross cutting nature of the proposals to be received can be clearly identified in advance.
- **Proposals with horizontal interest.** These relate to proposals which are of general interest to all parts of the specific programme but of no specific interest to an individual part. If such proposals are truly innovative and ground breaking, there is the possibility of referring them to the work programme part that addresses “anticipating scientific and technological needs”, once this part is open for the receipt of such proposals. Proposals with a horizontal interest which do not meet this criterion may, if applicable, be handled like proposals with a centre of gravity (see first bullet point).

6. Evaluation Criteria and Related Issues

The “Guidelines on Proposal Evaluation and Project Selection Procedures” describes the basic procedures to be followed by all programmes under the Sixth Framework Programme of the European Community.

The set of criteria applicable to this work programme is given in Annex B. Any complementary criteria are clearly stated in the relevant part of this work programme. Evaluation thresholds for each set of criteria are given in Annex B and apply unless otherwise clearly stated. In addition, Annex B outlines how the following will be addressed: gender issues, ethical and/or safety aspects, and the education dimension.

All proposals before they are selected for funding and which deal with ethical issues and any proposal for which ethical concerns have been identified during the scientific evaluation may be reviewed by a separate ethical review panel. The “Guidelines on Proposal Evaluation and Project Selection Procedures” gives more details on the evaluation procedure as a whole as well as details of the ethical review procedure.

Furthermore, the work programmes, and consequently their calls for proposals, may specify and restrict the participation of legal entities in an indirect action according to their activity and type, according to the instrument deployed and to take into account specific objectives of the Framework Programme.

Calls for proposals may involve a two-stage evaluation procedure. When such a procedure is employed, this is stated clearly in the call for proposals. More information on this process is given in the “Guidelines on Proposal Evaluation and Project Selection Procedures”.

Finally, when evaluating proposals received in response to a call, the Commission may opt to send the proposals to external experts or make proposals available by electronic means, so that the experts can carry out their examination at their home or place of work.

7. **Specific Support Actions**

Support activities are more limited in scope than the accompanying measures of the previous Framework Programmes. These projects aim to **contribute actively** to the implementation of activities of the work programme, the analysis and dissemination of results or the preparation of future activities, with a view to enabling the Community to achieve or define its RTD strategic objectives. Therefore, a significant emphasis has been placed on Support Actions:

- to promote and facilitate the dissemination, transfer, exploitation, assessment and/or broad take-up of past and present programme results (over and above the standard diffusion and exploitation activities of individual projects);
- to contribute to strategic objectives, notably regarding the European research area (e.g. pilot initiatives on benchmarking, mapping, networking, etc.);
- to prepare future community RTD activities, (e.g. via prospective studies, exploratory measures. pilot actions etc.);

as opposed to awareness and information exchange activities, e.g. annual Workshops and Conferences, that would take place anyway without Commission support. The latter activities will not be welcome if they do not **serve** the programme’s strategic objectives, (in the sense of the European Research Area, improved co-ordination, public awareness, preparation of future Community initiatives, etc.).

A limited number of specific support actions may be funded, where such a request does not fall within the scope of a call for proposals, when they have particular characteristics and value to the objectives and the scientific and technological content of the specific programme. Such requests for grants must be for actions of European significance and could, for example, provide support for major policy-related workshops in the context of activities of the rotating Presidency of the Union. They should be submitted at least five months in advance of the event for which support is requested. The evaluation criteria will be those applicable to specific support actions as laid down in this work programme.

3.2 NMP Priority introduction

The twofold transition towards **knowledge-based society** and **sustainable development** demands new paradigms of production and consumption. There is a need to move from resource-based approaches towards more knowledge-based ones, from quantity to quality, and from mass produced single-use products to new concepts of higher added value, eco-efficient and sustainable products, processes and services.

3.3 Objectives, Structure and Overall Approach

The primary objective of this thematic area is to promote real **industrial breakthroughs**, based on scientific and technological excellence. Radical breakthrough can be achieved through two complementary approaches:

- creation of new knowledge;
- new ways of integrating and exploiting existing and new knowledge.

This requires changes in emphasis in Community research from short to longer term as well as in innovation, which must move from incremental to radical innovation and breakthrough strategies, while emphasising an integrating approach.

The **transformation of industry** towards high-added value organisations necessitates real integrated approaches, either “vertical”, combining materials sciences, nanotechnologies and production technologies, as well as other technologies based e.g. on information technologies or biotechnologies, or “horizontal”, combining multi-sectoral interests.

An integrated approach should cover consumption patterns so that the complete industrial cycle conforms to the societal requirement for sustainability. Particular attention will be given to the **strong presence and interaction** of innovative enterprises, universities and research organisations in research actions. **Research projects** are required that give research organisations and industry access to new technologies, therefore stimulating implementation of new approaches in most industrial sectors, **in particular SME intensive sectors**. A key issue will be to integrate **competitiveness, innovation and sustainability** into consistent RTD activities. This is why it is extremely important and relevant that industry itself is well represented and integrated in the proposed research projects. The integration of **education and skills development** with research activities will play an important role in increasing European knowledge, in particular in nanosciences and their associated new technologies, opening up opportunities for numerous industrial applications. In addition, it is expected that breakthrough research activities should help to foster dialogue with society and generate **enthusiasm** for science.

To realise the work programme the following instruments will be used: Integrated Projects (IP), specific targeted research projects (STREP), co-ordination actions (CA), and specific support actions (SSA). Given the good coverage of Networks of Excellence under the previous calls, no further NEs are foreseen in the current work programme. The research areas described below are valid for the 2004-05 calls, and they specify both crucial research topics, around problems which have to be addressed urgently, and more long-term objectives for which structuring actions are to be preferred.

3.4 Technical content

The work programme 2005 presented below introduces each area and gives a description of the topics for which project proposals are invited. For each topic, the work programme specifies which instrument is to be used. IPs should be addressed through a multi-disciplinary approach and may therefore be relevant to more than one topic but should nevertheless be clearly focussed on a single topic, whereas STREPs should be targeted at exploring the frontiers of knowledge in the fields described below. As there is competition between topics, this could consequently result in no proposal being supported in some topics under the 2005 calls.

3.4.1 Nanotechnologies and nanosciences

Nanotechnologies and nanosciences represent a new multi-disciplinary and integrative approach to materials science and engineering, as well as to design new systems and processes by exploiting effects at the nano-scale and controlling the structure and self-assembly of materials. Europe enjoys a strong position in the nanosciences that needs to be translated into a real competitive advantage for European industry. The objective is twofold: to promote the creation of an RTD-intensive European nanotechnology enabled industry, and to promote the uptake of nanotechnologies in existing industrial sectors. Research may be long-term and high risk, but will be oriented towards industrial application and/or co-ordination of efforts at EU level. An active policy of encouraging industrial companies and SMEs, including start-ups, will be pursued through the promotion of strong industry/research interactions in consortia undertaking projects with substantial critical mass, in particular for IPs. Research and development activities should also promote development of new professional skills. For an effective development, European Universities may have to adapt with respect to education and training in nanosciences and nanotechnologies.

Whenever appropriate, ethical, societal, communication, health, environmental and regulatory issues, in particular metrology and measurement traceability aspects, should be addressed.

3.4.1.1 Long-term interdisciplinary research into understanding phenomena, mastering processes and developing research tools

Interdisciplinary research, to expand the generic underlying knowledge base of application-oriented nanosciences and nanotechnologies, and to develop leading edge research tools and techniques, is vital for the future of industry.

Selected topics for 2005:

- ***Towards “converging” technologies - STREP***

Probably the most significant advances in science and nanotechnological applications are expected to be realised by crossing the boundaries (“converging”) between previously separated scientific and engineering disciplines, including also the social, cognitive and neuro-sciences. This approach has the potential to offer new solutions to improve the quality of life e.g. by helping to alleviate the effect of disabilities or creating new types of nanotransducers. The expected STREPs will consist of research at the frontiers of knowledge addressing nanoscience approaches together with biotechnologies and information technologies jointly with social, cognitive and/or neurosciences. Additional expertise from other disciplines can be integrated if appropriate. Topics related to security are excluded here.

- ***Standardisation for nanotechnology - – SSA***

The Commission communication COM338(2004)¹⁰ highlights the need for activities in metrology. It is becoming urgent that the standardisation needs for Europe are reviewed in consultation with key stakeholders so as to facilitate industrial take up and development by providing harmonised quality standards and measurement techniques. This will also contribute towards making products safe and thus to gain users’ and consumers’ confidence. The expected SSAs should have the objective of identifying measurement tools and standards, as well as priorities for pre-normative research and elaborating a standards foresight and roadmap for nanotechnology. The expected SSAs should last a maximum of 18 months. Participation of research teams from all over the world is encouraged, according to rules, as well as the participation of industry and standardisation bodies.

3.4.1.2 Nano-biotechnologies

¹⁰ See http://europa.eu.int/comm/research/industrial_technologies/articles/article_958_en.html

Europe needs and can strongly benefit by supporting research into the integration of biological and non-biological systems, opening new horizons in many applications, such as for processing and medical and environmental analysis systems.

Selected topics for 2005:

- ***Using nature as model for new nanotechnology-based processes – STREP***

Nanotechnology-based phenomena such as the functioning of an insect body, adhesion on smooth surfaces, biomineralisation, functioning of natural nanotubes or photosynthesis are complex natural processes that could provide an ideal basis for nano-, micro- or macro-technological possibilities in many industrial application areas, energy production and/or novel and high added value products/services. The expected STREPs should consist of nanotechnology research of great novelty, at the frontiers of knowledge; however, they should not consist of mere materials sciences research (e.g. development of biomimetic materials), even if very challenging, but the expected STREPs should address the natural processes under a nanotechnology approach with the final aim of opening new ways for future industrial processes.

3.4.1.3 Nano-metre-scale engineering techniques to create materials and components

There is an increasing need to develop novel functional and structural materials of superior performance for industry by controlling their nanostructure. This will include technologies for their production, characterisation and processing.

Selected topics for 2005:

- ***Three dimensional nano-structures based on elements other than carbon - STREP***

Nano-tubes, -cones –spheres, -coils, -cubes, or other three dimensional nano-structures (3D NS) are the subject of intense and steadily growing research effort due to their wide and very promising potential. Until now, carbon-based 3D NS have been more extensively investigated, but other elements can be used to realise them, either alone or in various combinations. The expected STREPs should be at the frontiers of knowledge, and should present an important industrial potential. They should be aimed at developing new 3D NS or analogous or derived three-dimensional regular nano-structures (such as nano-fibres) composed of elements other than carbon or in combination with it. If combined with carbon, the other elements should be covalently bound to it and not e.g. just “trapped” in a carbon nano-structure. In the expected STREPs, research into novel functions and the characterisation of their performances, such as new mechanical, electrical, electrochemical, magnetic or other properties can be included. Whenever appropriated, dedicated modelling and metrology issues could also be addressed.

3.4.1.4 Development of handling and control devices and instruments

It is important for Europe to develop efficient instrumentation for measurement, analysis and manufacture at the nano-scale. A guiding target for handling and controlling nanostructures should be a feature size or resolution of the order of 10 nm.

Selected topic for 2005:

None.

3.4.1.5 Applications in areas such as health and medical systems, chemistry, optics, food and the environment

Nanosciences and nanotechnologies are fast developing domains with great potential, both in terms of improving the quality of life of all people and of creating wealth through novel knowledge-based and sustainable processes. The goal is to foster the potential nanotechnologies in breakthrough applications through the integration of research developments in materials and technological devices in an industrial context. The development of new, higher performance services, products,

components, appliances, devices, systems and processes still requires long term research efforts. The availability of up-to-date information and the development of realistic scenarios are key elements for elaborating possible forms and scope for the intervention of public funds.

Selected topic for 2005:

- ***Nanotechnology-based targeted drug delivery – IP***

Therapeutically useful compounds for drug delivery are often difficult to administer to the targeted body part due to their composition, structure or size. Therefore, suitable delivery vehicles must be sought to carry and release drugs precisely where they are targeted. The absorption of drugs can be significantly enhanced through nanotechnology-based systems e.g. nanoparticles which can be used in combination with chemical compounds to deliver drugs exactly into the targeted cells. In this context, the integration of nanotechnological developments should lead to novel and safe breakthrough solutions for therapeutic drug administration using improved knowledge of nano-scale structures such as e.g. nano-scaled carriers, nano-layers, liposomes, fullerenes, nanotubes and dendrimers. The final objective is the development of innovative targeted drug delivery systems for the health care of the future. The expected IPs should have a substantial industrial participation. In particular education and training, societal, health, ethical and regulatory issues, validation, metrology and toxicological issues should also be included where these are relevant.

- ***Interaction of engineered nanoparticles with the environment and the living world – STREP***

Society and industry need a great deal more knowledge on the understanding of the interaction of engineered nanoparticles (NP) with the environment and the living world. Engineered NP produced on a laboratory or an industrial scale have various characteristics which depend upon chemical composition, chemical and physical surface treatment, size and shape etc. and thus interact in different ways with the environment and the living world. The expected STREPs should address interdisciplinary toxicological and eco-toxicological research on as many aspects as possible of the interaction of NP with the environment and the living world, i.e. exposure, including intake, uptake, time scale; dose and response, including cellular and molecular mechanisms, bio-persistence, bio-kinetics, etc. Emphasis is to be put on a systemic view of exposure, dose and response to better understand the underlying molecular and bio-molecular phenomena. Asbestos and other extensively studied particles are excluded. Animal testing should be avoided ; alternative ways are encouraged. Participation of research teams from all over the world is encouraged, according to rules, as well as the participation of industry.

3.4.2 Knowledge-based Multifunctional Materials

New, high knowledge-content materials, providing new functionalities and improved performance will be critical drivers of innovation in technologies, devices and systems, benefiting sustainable development and competitiveness. Since their applications have a strong impact on individuals and on society as a whole, a new research culture will be required. RTD activities are expected to be high risk, inter- and multi-disciplinary, long term and generic, with potential benefits in material, maintenance and energy savings as well as on health, safety and the environment.

Breakthroughs will come not only from the new materials developed but also from new processing, overall product design and from the new approaches taken for example using renewable materials or interface design. A further need is to break away from the classical boundaries between types of materials that have characterised European research for the last few decades. To assure Europe's strong position in emerging technology markets the various actors need to be mobilised through leading edge multidisciplinary RTD partnerships and high-risk research.

3.4.2.1 Development of fundamental knowledge

- ***Interfacial phenomena in materials - STREP***

Interfacial phenomena are essential to understand the properties of multifunctional materials. They are also highly relevant during their processing and in their evolution under service conditions, and can be determinant for their final industrial applications. The structure of interfaces, their reactivity, diffusion phenomena, and the stability of interfaces in dissimilar materials, such as hybrid and composite materials, need to be better understood. The activities should address a drastic extension of knowledge on the interfaces in multifunctional materials, and in particular in nanostructured materials.

The expected STREPs should exclusively address the multidisciplinary study of interfacial phenomena that can lead to new and better multifunctional materials. Experimental, modelling and theoretical approaches should be combined synergistically. Purely surface-related phenomena are excluded.

- ***New generation of tools for advanced materials characterisation - STREP***

The development of new materials of superior performance requires new instruments in order to characterize the structure and properties (chemical, physical, etc.). Fast and easy-to-use characterisation tools to control the processing parameters are also crucial for the competitiveness of European industry.

The expected STREPs should aim at radically new approaches in the development of in-situ and ex-situ characterisation tools, and in particular for measurements under extreme conditions. Nano-tools are excluded.

- ***Methods of computational modelling of multifunctional materials - CA***

Computational modelling has become a major tool to understand materials properties, as well as in their design and industrial use, due to the ever increasing computing capabilities. Numerous methods are now available, ranging from ab-initio calculations and molecular dynamics to the macroscopic finite-element techniques, and the all-encompassing multi-scale approaches.

The expected CAs should focus on the coordination at European level of multi-scale computational modelling activities linked with standardization, dissemination, validation and use of computer models, codes and techniques in the domain of multifunctional materials, and contribute to strengthen links between different research initiatives, such as EUREKA, COST, national, regional and Commission projects.

3.4.2.2 Technologies associated with the production, transformation and processing of knowledge-based multifunctional materials

- ***Advanced materials processing – CA***

There is a pressing industrial need for major improvements in the sustainable processing of multifunctional materials which can contribute to clear benefits in the fabrication of industrial products.

The expected CAs should focus on the coordination at the European level of efforts to help in the harmonisation and widespread dissemination of the most advanced processing methods (e.g. laser technology, plasma processing, super-critical fluid treatment) and contribute to strengthen links between different research initiatives, such as EUREKA, COST, national, regional and Commission projects.

- ***Development of nanostructured porous materials - IP***

The objective is to develop new porous materials that can be tailored at the nanoscale and new processing methods to control porosity. Porous materials, including polymer membrane materials, are highly relevant for important industrial sectors, such as catalysis, electrochemistry, gas separation or waste treatment. Cellular solids such as metallic foams are used, for instance, for filters and catalysts as well as for thermal management and structural applications.

The expected IPs should be led by industry. The focus is on extending the performance of porous materials (microporous, chemical structure with exceptionally high surface area, aerogels, etc), with intrinsic or extrinsic porosity, with applications for membranes, filters and catalysis.

- ***Multifunctional ceramic thin films with radically new properties - STREP***

Thin films have become a major research area, with applications in sectors such as electronics, optical and magnetic devices, protection coatings, electrochemistry or catalysis. Functionally-graded or multi-component, nanostructured films allow further flexibility in the tailoring of properties.

The expected STREPs should focus on new multifunctional ceramic thin films (nitrides, carbides, oxides, etc) which provide components with radically new electronic, optical or magnetic properties for novel industrial applications.

3.4.2.3 Engineering support for materials development

- ***Materials by design: multifunctional organic materials - STREP***

The flexibility in the design and processing of organic solids (usually polymers) allows them to meet the requirements of many technologically significant applications. Multifunctional organic materials are used in displays, electronic circuits, solar cells, chemical sensors and actuators, lasers, storage media and electronic paper, as well as for insulation and packaging in electronics.

The expected STREPs should aim at highly innovative long-term research for the development of new multifunctional organic materials for electronics, including modelling and experimentation, and considering as well their processing and potential applications. The objective is to increase the capability of industry to have materials with characteristics needed for the intended applications. Molecular and nano-electronics are excluded.

- ***Materials for solid state ionics - STREP***

Understanding ionic transport in solids, and in particular in nanostructured materials, is the key to many technological applications in wide temperature ranges, for instance in solid state batteries, supercapacitors, conducting membranes, electrochemical gas sensors and electroceramic devices.

The expected STREPs should focus on highly innovative multidisciplinary research to develop electrodes and electrolytes providing improved ion and/or electron transport and reactivity, in particular for microbatteries in mobile micro-systems. Developments in the field of fuel cells are excluded here.

3.4.3 New Production Processes and Devices

The overall aim is to support the transformation of European industry towards a knowledge-based and added value industry for improved competitiveness and sustainability. This requires the development of new production concepts that radically change the way manufacturers design, build and support products, processes and services. Breakthrough production concepts "beyond conventional approaches" are needed to better position the industries to exploit the emerging technologies. Research must provide industry and industrial systems of the future with the necessary tools for efficient life-cycle design, production, use and recovery, decreasing at the same time internal and external costs and reducing major accident hazards. Appropriate organisational models and improved knowledge management should support technological developments and innovation routes in a holistic perspective. Flagship research projects need to be carried out, the major outcome of which would be a framework and infrastructure conditions for a world class European manufacturing industry "Manufuture" based on substantial involvement of industries.

3.4.3.1 Development of new processes and flexible, intelligent manufacturing systems

Emerging from ongoing research are new generations of micro systems, embedded systems and miniaturised product technologies, including advances from the new nano-science and technology

projects that hold the promise of promoting intelligence and flexibility to industrial systems. The next step is now the development of new industrial production technologies which must overcome the present barriers for the industrial production of such new, highly complex and integrated micro systems and miniaturised products. Also, flexibility in the manufacturing systems of discrete goods is another challenge due to decreasing life cycle time of products as well as an increasing number of variants. Current trends necessitate the development of assembly technologies and processes reaching a new high level of flexibility, while at the same time taking into account reusability needs as well as new assembly component supply mechanisms. It is encouraged that the educational needs relevant to new production technologies be also considered along the lines of the "Manufuture" concept. Straightforward approaches should be inspired to develop educational tools and test-environments in order to learn about and evaluate the new production technologies and organisational forms.

Selected topic for 2005:

- ***New production technologies for new micro-devices using ultra precision engineering techniques – IP***

The aim is to provide industry with radically new production technologies and systems that meet the requirements for up-scaling from prototype or laboratory to full industrial scale production of the new generations of micro systems, embedded systems and miniaturised products. This should bring high added-value and strategic products to the market with minimum time loss in setting up production lines

The research work should provide production functionalities and capabilities overcoming present technology barriers to the cost-effective manufacturing of new and emerging products, enabling industrial-scale manufacturing of the highly complex components and systems that are emerging from ongoing research on micro-products.

Clear scalability benefits should be demonstrated in terms of technical performance, flexibility and cost and with due considerations for sustainability and the environment.

The expected IPs will be characterised by strong industrial leadership. They should consider all aspects, including ultra-precision engineering techniques, from the concept and design phase to industrial production and assembly processes, measurement and control functions, ensuring certain quality and reliability of the processes and the production system. They should clearly support the latest scientific developments towards new products, which integrate a wide spectrum of disciplines and functions, such as mechanical, electrical, electronic, biological, microfluidic, power, radio frequency communication and IT.

- ***Next generation of flexible assembly technology and processes - IP***

Fast reconfigurable manufacturing operations that rely on a flexible manufacturing solution are considered to be the response needed by industry to meet continuously fluctuating demands for the supply of new products. The aim is to develop production concepts that produce on-demand products of high complexity with highly reduced costs of production fulfilling the requirements of increasing product-service life cycles and increasing product variants which correspond to ever smaller lot sizes and accelerated time-to-market. An additional goal is to achieve high levels of reusability of assembly equipment and new forms of assembly component supply to minimise assembly costs.

The seamless integration of assembly operations in the product life cycle (design for assembly, simulation, rapid manufacturing, re-use of disassembly components and associated services) is the key to successful implementation strategies for such concepts.

The expected IPs with strong industrial leadership should address new concepts in assembly characterised by the integration of mixed, automated and manual, workplaces so as to compensate for uncertain production volumes; "plug & produce" system functionality with in-line reconfiguration capability; in-line control solutions, mechatronic building blocks for low cost manufacturing systems, spontaneous networking concepts on shop-floor level and strategies for improved reusability of equipment, e.g. through increased sensor- and system integration and simplified user-interfaces/ programming tools.

Electronic circuit assembly is not included in this topic.

- ***New concepts for global delivery - STREP***

In order to serve regional markets efficiently and to achieve cost-optimal production and logistic processes in the future, European companies have to integrate themselves in global supply and distribution networks. The efficiency and operative excellence of the logistic processes in this network is of predominant importance in order to source and deliver fast and in time under strong cost considerations.

The expected STREPs should focus in an integrated way on three primary issues: design, planning and operation of logistic networks. The structural **design** for such logistic networks and the optimised placement of a company within that network is inducing a substantial amount of the costs for the later operation of the network. New ways and methods for the design and evaluation of such networks integrating the levels of the overall network structure, the related operational processes and the facilities realising the processes should be highlighted. It is encouraged that aspects of mobile logistic platforms be considered as part of the entire logistic design which increases the value adding capability of the supply chain. For the **planning** of the operational processes new concepts for the generation of a segment-related network transparency using identification and communication technology enabling collaborative planning and control approaches are to be developed, making it possible for the different partners in the network to generate harmonised plans and react quickly to demand changes and network events. Resources carrying out the **operational processes** in the network are to be redesigned, exploring new ways of adaptability and autonomy in their operations in order to cope with the fast changing requirements in the network. Collaboration between work groups distributed all over the world covering design, planning, production tasks would be enhanced

- ***Roadmapping and foresight studies on the future of manufacturing (Manufuture¹¹) - SSA***

The objective of the SSAs is to provide support for the development of *Manufuture* concepts and additional follow-up actions for the time period 2006-2008. The expected SSAs should provide support for policy makers, industries, researchers and other stakeholders to develop new approaches for assisting European industry's transition towards a knowledge-based, competitive and sustainable base. The activities should be focused on the development of specific roadmaps and foresight studies in emerging enabling manufacturing technologies in the *Manufuture* context as well as the dissemination of these results.

- ***Coordination of European Manufacturing Research Activities - CA***

The objective of the CAs is to pull together and validate the results of activities supported through national, EUREKA and Community funding, in the manufacturing domain. The results could be presented for example in the format of a knowledge base in future manufacturing technologies that can be accessed by European Industry. The approach should also include measures to assist companies in taking up new technologies and adopting new organisational or business models as appropriate. The activity could concentrate on some or all of the areas mentioned under "Embracing systemic and disruptive approaches in the Milan *Manufuture* document, it could address the importance of ICT as an enabling technology; new materials and new design paradigms; miniaturisation and precision engineering; integrative approaches, e.g. mechatronics, process control, extended products and new technologies for tomorrow's products.

3.4.3.2 Systems research and hazard control

It is important for Europe to contribute to improved sustainability of industrial manufacturing and processing systems and to substantial and measurable reduction in environmental and health impacts.

¹¹ In December 2003, the Conference 'Manufuture' - European Manufacturing for the future - was organised under the auspices of the European Council Presidency (see: www.manufuture.org) to raise the profile of manufacturing and to discuss future directions. As a follow-up, the Commission has established a High Level Group of experts to further elaborate the 'Manufuture' vision and to progress towards a concrete strategic long term research agenda for the manufacturing sector.

As far as safety is concerned, research will be carried-out for industrial risks linked with modern, knowledge-based manufacturing paradigms and their social consequences. Research effort should help explore new concepts, expected to support the technological and reference basis for the EU Environmental Technologies Action Plan (ETAP)¹².

Selected topic for 2005:

None

3.4.3.3 Optimising the life-cycle of industrial systems, products and services

As products and production systems are increasingly life-cycle, quality and service oriented, the requirements of intelligence, energy-saving, cost-effectiveness, safety and cleanliness, present key challenges for new industrial and consumption approaches based on eco-efficiency. This objective must allow the development of new concepts for production, products, processes and organisational innovation.

Selected topic for 2005:

None

3.4.4 Integration of nanotechnologies, new materials, and new production technologies for more cost and eco-effective sectoral applications

Following the experience of the first two years of the NMP priority, and in line with the 'Lisbon' targets, Area 4, integrating nanotechnologies, materials science and advanced technologies has become more relevant, both in terms of improving the quality of life of all people and of creating wealth through novel knowledge-based and sustainable products and processes. The goal is to foster breakthrough applications through the integration of multi-disciplinary research developments in an industrial context. Research effort should help explore new concepts, expected to support the technological and reference basis for the EU Environmental Technologies Action Plan (ETAP)³.

Selected Topics for 2005:

3.4.4.1 Multifunctional material-based factory of the future – IP

The aim is to integrate science-based transformation processes, building on already achieved multifunctional and other material advances including nano-materials into factory configurations that would be capable of manufacturing products and their associated services on demand. The concepts would have to propose validated cost-effective solutions, up to proof-of-concept level.

The concepts should include production of net or near net-shape products produced directly from specifications. The underlying processes will deliver 3-D distribution of properties, irrespective of whether they are homogeneous or varying driven by product specifications. All transformation processes will add value eliminating corrective actions and having no secondary effects. All manufacturing processes and equipment should use real-time, intelligent control based on direct measurement of key transformation parameters. All processes should be highly efficient regarding energy, minimise the impact on the environment and the products would have traceable in-built capability for continuous life-cycle monitoring and assessment including reclamation of components. The expected IPs with strong industrial leadership, should, for either discrete or continuous production, validate that the system proposed can deliver an integrated product realisation factory set-up in which products flow from concept to delivered part, with the best processes in every step with no false starts and no prototypes.

3.4.4.2 New construction products and processes for high added value applications - IP

¹² See: <http://europa.eu.int/comm/environment/etap/index.htm>

The construction sector has a key role in achieving European economic, social and environmental objectives by improving the efficiency and sustainability of the processes involved in the creation, operation and maintenance of the built environment. Targets are that life cycle costs should be reduced by at least 30% and delivery time should be reduced by 50%. Quantitative targets should also be considered for reduction of energy consumption and for waste minimisation. The use of innovative technologies such as virtual design, construction and maintenance methods, embedded systems, product and process simulation technologies, knowledge engineering tools should be enhanced to create customer-driven development processes.

The final outcome should be a new approach to promote the industrialisation of human friendly, efficient, sustainable, inherently safe and secure construction added value processes and the underlining business model.

The expected IPs should be under strong industrial leadership and should aim at creating high value added in the whole construction process, from design, construction and operation to maintenance, including components manufacturing, refurbishment and decommissioning. The approach would use life cycle management strategies, sustainable construction processes, new high performance materials, deployment of nano-materials, new processes and systems and information technology.

The integration effort should demonstrate against performance criteria the progress towards innovative high-performance construction components and products including the underlying processes and practices.

3.4.4.3 Mastering “Industrial Biotechnology”- Environmental Technology for sustainable production of added value products - IP

As referred to in the Environmental Technology Action Plan (ETAP), “industrial biotechnology” can play an important role in the development and validation of sustainable production systems that integrate activities such as research at molecular level (site directed application of biocatalysts), renewable raw materials as feedstock and their transformation /conversion processes. Future production routes must substitute non sustainable conventional processes by bioprocesses under inherently safe and controlled conditions, for the conversion of renewable raw materials into non food added value bio-based products. The focus would be on surfactants and speciality polymers.

The expected IPs, having a strong industrial leadership, should encompass innovation related activities, like identification of environmental benefits and life cycle costing of bio-based products and processes.

The integration efforts ranging from the nano-scale level up to industrial engineering. Particular attention should be given to the improvement of enzyme activity and substrate specificity for both tuning the reaction and reducing the number of processing stages.

3.4.4.4 Multi-functional technical textiles for construction, medical applications and protective clothing – IP dedicated to SMEs¹³

Multi-functional technical textiles represent a growth area for the textile industry offering an enormous scope for innovation and a wide range of potential applications and products, such as tensile structures, protective clothing against thermal and other risks, use in industry and biomedical clothing for tele-monitoring of health parameters.

The expected IPs should be industry led, while relying on scientific and technological cooperation with universities and research centers, as appropriate. Nanotechnology based solutions for breakthrough applications are particularly encouraged. Multidisciplinary research should focus on developing new functionalisation techniques (e.g. for anti-bacterial, photochromic, anti fire, slow release, etc); intelligent encapsulation techniques, thin layer coatings with organic, inorganic hybrid materials and new techniques for integration of smart sensors and actuators. Wherever necessary, toxicity, societal and ethical aspects should be taken into consideration as well as specific metrology issues.

3.4.4.5 Simultaneous engineering and production of integrated high-tech components for European transport - IP dedicated to SMEs³

¹³ See sections 3.5 and 3.6

The objective is to develop innovative concepts for the production of high technology transport components, exploiting the emerging capabilities in the area of nano and micro technologies as well as through multifunctional materials, targeting the lower end of the value chain. To process these innovative components, an integrated engineering and production strategy is needed, which allows for late configuration, high flexibility through standardised technology interfaces and reliable and cost effective manufacturing.

The research will develop and produce components and systems to form larger modules and entities primarily for vehicle such as chassis and vehicle bodies. Proof-of-concept deliverables will have to meet the challenge of high quality, high volume and cost effective production that links integrated engineering and manufacturing processes to the next generation vehicles. These would be based on the synchronized application of manufacturing and product technologies organized within highly reactive and harmonized production and engineering processes throughout the supply chain that allows the introduction of a highly innovative built-to-order system.

The expected IP-SMEs will be centred around this strategy and focus on the needs of and benefits to SMEs operating in the value chain.

3.4.4.6 Biomaterials technologies for implants - IP dedicated to SMEs³

The focus is on the introduction of new materials and/or technologies at all phases of well established knowledge-intensive SMEs which manufacture implants and their added-value chain. The expected IP-SMEs are specifically aimed at major innovations in the orthopaedic, dental and cardiovascular implant industry. Examples of areas where breakthroughs are needed include: fixation devices such as bone plates and screws (specifically the development of new bioresorbable devices with enhanced mechanical properties and/or an anisotropic behaviour), synthetic graft materials, fillers for bone, cartilage and dental restoration, bone cements, coatings for optimizing implant performance, functionality and biocompatibility. Implants containing cells will only be considered as relevant if it is clear that the cell-free alternative is unlikely to provide a breakthrough.

3.4.4.7 Nanotechnological approaches for improved security systems – IP dedicated to SMEs³

Security is a topic of rapidly increasing importance. Highly innovative solutions are to be developed e.g. for early warning systems for harmful substances in the environment, for example, in the water and food supply chains, effective detoxification systems, detectors for explosives, advanced person or goods identification systems, etc. The expected IPs dedicated to knowledge-intensive SMEs should address research of novel and highly advanced solutions and –where, if appropriate, actions preparing for their effective implementation such as education and training or metrology are included. The development of systems detecting illegal drugs can be addressed here. Technical textiles for construction, medical applications and protective clothing are excluded here.

3.4.5 Cross-priorities actions and links to other research actions

Clear links exist also between this Priority and **Priority 6** "Sustainable development, global change and ecosystems" in the domain of Hydrogen and fuel cells and a co-ordinated call is to be organised with a deadline in 2005. Actions to improve synergies between Member States (current and new) and Associated States research activities and EUREKA are also planned.

3.4.5.1 Basic materials and industrial process research on functional materials for fuel cells - STREP

The objective is to develop highly efficient, low cost multi-functional materials, in particular nano-structured materials, and processes for reducing fuel cell stack and system costs, and improving specific performance and durability.

Activities should involve fundamental materials research on proton and ion conducting electrolytes (polymer and ceramic), gas diffusion layers, non-noble catalysts, and related technologies, including

in-situ characterisation and modelling to improve *inter alia* understanding of gas and water transport and degradation mechanisms. Research is also needed on high performance nano-structured materials, capable of being produced at large scale and low cost, for bi-polar plates and electrode sealing. The suitability for scaling up to mass manufacture, supported by necessary studies and value analysis, must be taken into account.

The expected STREPs should focus on research at the frontiers of knowledge, aiming at radically new multifunctional materials for fuel cell electrode/electrolyte materials for “high temperature” (130-200°C) PEMFC and “low temperature” (ca. 600°C) SOFC applications.

3.4.5.2 Improved, energy efficient hydrogen storage systems especially for transport - STREP

The objective is to develop radically new hydrogen storage media with the potential to meet vehicle on-board hydrogen storage requirements (of at least 6wt% for the complete system), operating at near ambient temperature and pressure, with high round trip, charge/discharge energy efficiency.

Activities should involve fundamental materials research to develop new materials for hydrogen storage with high specific capacity and high energy efficiency for charge/discharge, including nano-structured porous materials, chemical hydrides. Materials development may be supported by theoretical modelling to improve understanding of heat and mass transfer in porous nano-structured materials to guide systems development.

The expected STREPs should focus on leading edge research directed at highly innovative, nano-structured hydrogen storage materials.

3.4.5.3 Cooperation with Third Countries in the field of nanotechnology, advanced multi-functional materials and new ways of production research – SSA

Expanding the frontiers of knowledge requires substantial effort in terms of e.g. creativity, scientific and technical talents, availability of high quality infrastructures, financial resources and understanding of possible implications. Valuable synergy can be achieved at international level. For this purpose, appropriate contacts should be established amongst European researchers and research teams from Third Countries. The expected SSA should consist of actions and initiatives to foster real and effective cooperation at the level of research teams with a view to creating international teams of excellence in the fields covered by Priority 3, stimulating the participation of Third Countries where real added value can be ensured. Co-operation with Third “INCO” Countries (Russia, New Independent States, Southwest Balkans, Mediterranean Countries, Developing Countries) is particularly encouraged and these countries are eligible for receiving European Community funding, according to the appropriate rules under the current Framework Programme.

3.5 Implementation plan and related issues

3.5.1 Instruments

- Integrated Projects (IP): For this Priority, an integrated project should include all necessary activities to ensure industrial breakthrough and transformation of industry in a dynamic and effective way, for the benefit of industry and society. In this context, a substantial industrial participation is expected. The activities should also lead to a positive image of industrial research.
- Integrated Projects dedicated to SMEs (IP-SMEs) are also implemented by this Priority, with the aim of reinforcing the SMEs S&T knowledge base.
- Networks of Excellence (NE) are not implemented in the third calls.

For this Priority, the evaluation of proposals submitted under the new instruments (IPs) will be organised in two stages. The rationale for this is due to the specific nature of this Priority, which is multidisciplinary, cross sectoral and SME intensive, for which a “bottom up” approach is encouraged. The first stage proposal should address only a reduced set of the evaluation criteria. Coordinators of retained proposals in stage 1 will be invited to submit a complete proposal that will be then evaluated against the entire set of evaluation criteria.

Three other instruments will complement the IPs.

- Specific Targeted Research Projects (STREP) at the frontiers of knowledge: In the scope of Priority 3, for 2004 calls, such projects should be targeted at exploring the frontiers of knowledge and to support long term innovation and transformation of industry. The objective is to help develop innovative technologies to meet the needs of the future society. Such projects could be considered as incubators for future IPs.
- Co-ordination Actions (CA): The objective is to strengthen links between different research initiatives, such as EUREKA, national, regional and Commission RTD projects. For this Priority, pilot projects would be welcome in order to explore methods of such co-ordination with EUREKA, COST and ESF activities.
- Specific Support Actions (SSA): In the scope of Priority 3 such measures are used to support long-term research activities. For a positive evaluation, their impact should be ensured at a broad international level. An example could be to consolidate scenarios for the future (time horizon 2010-2015) setting out development and technology road maps, not forgetting barriers to development, in support of sustainable and knowledge intensive production, in the context of international co-operation. Another example might be to look at factors for improving the interaction between researchers and public authorities, regulators or standardisation bodies, about “success” and “failure” factors.

3.5.2 Implementation and Budgetary Planning

Call updates for 2004-05 - See call fiches in section 3.6.

A **call** (call NMP-NI-4) will be launched by the end of 2004, for an indicative funding of **150 M€** devoted to the new instruments (IPs), opened in the fields identified in section 3.4. For the new instruments the closing date for receipt of first stage proposals is **17 March 2005**. Co-ordinators retained in stage 1 will be invited to submit a second stage proposal by the indicative deadline of **15 September 2005**, at 17.00, Brussels time. Considering the indicative budget available for this call about 15 proposals are expected to be supported (see also section 3.6 - call information).

A budget of **120 M€** indicative will be devoted to other instruments (STREP, CA, SSA), also called by the end of 2004 (call NMP- TI-4). The closing date for this call is on **15 September 2005**, 17.00, Brussels time.

A call (call NMP-SME-4) targeting SMEs Integrated Projects will be launched by the end of 2004, with an indicative funding of **100 M€**. The deadline for the first stage proposals will be on **17 March 2005**, 17.00, Brussels time, and for the second stage proposals on **15 September 2005**, at 17.00, Brussels time.

SMEs can of course participate in each and every call for proposals. However, ***Integrated Projects dedicated to SMEs*** are specifically designed to encourage SMEs efforts towards research and innovation. Such Integrated Projects should be led by ***SMEs with R&D capacities*** with, obviously, possible participation of universities and research centres. Other industries and industrial associations can participate whenever it is either essential or highly desirable in terms of the role of SMEs in the supply chain. Proposed activities should be clearly centred on reinforcement of the SME S&T knowledge base and validation of innovative solutions within broad international as well as regional contexts. Results of such IPs should clearly be for the benefit of SMEs.

Mobilisation of resources from SMEs with research capacities, in particular knowledge-intensive SMEs and those with high potential for innovation, should be substantial. Activities to be carried out should benefit to the shift of less intensive RTD sectors to RTD intensive and higher added value sectors. They should lead to a positive image of industrial research.

Indicative Budgetary Road map¹⁴

	2003	2004	2005	2006
Calls 2003				
NMP 1 (NI)	163.8	136.9		
NMP 1 (TI)	114.4	48.7		
NMP-2 SMEs	6	30.4		
IST-NMP	2	38.3		
ACCs	0.5			
Calls 2004				
NMP 3 (NI)		245		
NMP 3 (TI)		105		
NMP 3 SMEs		80		
NMP3 STEEL		20		
NMP/NSF		6		
IST-NMP 2		90		
Calls 2005				
NMP 4 (NI)			5	145
NMP 4 (TI)			5	115
NMP 4 IP-SMEs				100

(1) operational budget; including ACC and AS participation and of which minimum 15% for SMEs;

(2) funds for INCO participants to be included in the funding of research projects

Table for the NMP first calls (2003)

Instrument	New Instruments M€	Other instruments (STREP, CA, SSA)
First Call	260 + 40 (1)	140 + 20 (1) (STREP, CA, SSA)
Joint call with Priority 2	25	10 (CA, SSA)
Dedicated Call for SMEs	40	
ACCs dedicated call		1

(1) ACC and AS budget

¹⁴ Any call budget information relating to 2006 is provided as advance information only. A new financing decision to cover the 2006 budget will be requested at the appropriate time next year.
Any call budget information relating to 2005 is provided under the condition that the draft budget for that year is adopted, without adjustments, by the budgetary authority.

Table for the NMP second calls (2004)

Instrument	New Instruments M€	Other instruments (STREP, CA, SSA)
Second Call	245 (IP, NE)	105 (STREP, CA, SSA)
Dedicated Call for SMEs	80 (IP)	---
Joint call “steel”	20 (IP)	---
Coordinated call with NSF		6 (STREP)
Joint call with Priority 2	90	

Table for the NMP third calls (2005)

Instrument	New Instruments M€	Other instruments (STREP, CA, SSA)
Third Call	150 (IP)	120 (STREP, CA, SSA)
Dedicated Call for SMEs	100 (IP)	---

3.6 Call information

Call fiche – Third call of priority 3 (NMP): New Instruments (IPs)

1. **Specific Programme:** Integrating and strengthening the European Research Area
2. **Activities:** Priority Thematic Area of research “Nanotechnology, ... processes and devices”
3. **Call title:** Thematic call in the area of “Nanotechnology, ... processes and devices”
4. **Call identifier:** FP6-2004-NMP-NI-4
5. **Date of publication**¹⁵: December 8, 2004
6. **Closure date(s)**¹⁶: For Integrated project (IP): (first stage), **17 March 2005** at 17.00 (Brussels local time).
7. **Total indicative budget:** 150 M € (*)

Instrument	€ (millions)
IP	150

(*) *Considering the indicative budget available for this call, about 15 proposals are expected to be supported.*

8. Areas called and Instruments:

Area	Instrument
Applications in areas such as health and medical systems, chemistry, optics, food and the environment	
3.4.1.5-1 Nanotechnology-based targeted drug delivery	IP
Technologies associated with the production, transformation and processing of knowledge-based multifunctional materials	
3.4.2.2-2 Development of nanostructured porous materials	IP
Development of new processes and flexible, intelligent manufacturing systems	
3.4.3.1-1 New production technologies for new micro-devices using ultra precision engineering techniques	IP
3.4.3.1-2 Next generation of flexible assembly technology and processes	IP
3.4.4.1 Multifunctional material-based factory of the future	IP
3.4.4.2 New construction products and processes for high added value applications	IP
3.4.4.3 Mastering “Industrial Biotechnology”- Environmental Technology for sustainable production of added value products	IP

9. Minimum number of participants:

Instrument	Minimum number of participants
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¹⁵ The Director-General responsible for the publication of this call may publish it up to one month prior or after its envisaged publication date.

¹⁶ When the envisaged date of publication is either advanced or delayed (see previous footnote), closure date(s) will be adjusted accordingly.

IP	<u>3 independent legal entities from 3 different MS or AS, with at least 2 MS or ACC.</u>
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10. Restriction on participation: None.

11. Consortia agreements:

- Participants in IP and NE are required to conclude a consortium agreement.

12. Evaluation procedure:

- For IPs, the evaluation shall follow a two-stage procedure. An outline proposal (stage 1), of a maximum of 20 pages (font size 12), addressing only a reduced set of the evaluation criteria i.e.: relevance, potential impact and S/T excellence shall be submitted at the closure date mentioned under item n°6 above. Proposals having passed the minimum thresholds required in the first stage (12 out of 15 for IP) will be retained for the second stage (“go” proposals). Coordinators of “go” proposals will be requested to provide a complete proposal, which will be evaluated against the whole set of evaluation criteria. The evaluation procedure will include ‘hearings’. The closure date for the second submission will be included in the invitation to complete the proposal (indicative closure date: **15 September 2005**).
- Proposals will not be evaluated anonymously.

13. Evaluation criteria:

- See Annex B of the work programme for the applicable criteria (including their individual weights and thresholds and the overall threshold) per instrument.
- For Integrated Projects attention will be given to the focus of the proposals with regard to the general objectives of Priority 3 as well as the specific objectives described for each topic covered by the call.

14. Indicative evaluation and contractual timetable:

- Evaluation results: estimated to be available within 2 months after the closure date;
- Conclusion of first contracts: it is estimated that the first contracts related to this call will come into effect by early 2006.

Call fiche – Third call of priority 3 (NMP) : Traditional Instruments (STREP, CA and SSA)

- 1. Specific Programme:** Integrating and strengthening the European Research Area
- 2. Activities:** Priority Thematic Area of research “Nanotechnology, ... processes and devices”
- 3. Call title:** Thematic call in the area of “Nanotechnology, ... processes and devices”
- 4. Call identifier:** FP6-2004-NMP-TI-4
- 5. Date of publication**¹⁷: December 8, 2004
- 6. Closure date**¹⁸: **15 September 2005** at 17.00 (Brussels local time)
- 7. Total indicative budget:** 120 M € (*)

Instrument	€ (millions)
STREPs, CAs and SSAs	120

(*) Considering the indicative budget available for this call, about 65 proposals are expected to be supported.

8. Areas called and Instruments:

Area	Instrument
Long-term interdisciplinary research into understanding phenomena, mastering processes and developing research tools	
3.4.1.1-1 Towards “converging” technologies	STREP
3.4.1.1-2 Standardisation for nanotechnology	SSA
Nano-biotechnologies	
3.4.1.2-1 Using nature as model for new nanotechnology-based processes	STREP
Nano-metre-scale engineering techniques to create materials and components	
3.4.1.3-1 Three dimensional nano-structures based on elements other than carbon	STREP
Applications in areas such as health and medical systems, chemistry, optics, food and the environment	
3.4.1.5-2 Interaction of engineered nanoparticles with the environment and the living world -	STREP
Development of fundamental knowledge	
3.4.2.1-1 Interfacial phenomena in materials	STREP
3.4.2.1-2 New generation of tools for advanced materials characterisation	STREP
3.4.2.1-3 Methods of computational modelling of multifunctional materials	CA

¹⁷ The Director-General responsible for the publication of this call may publish it up to one month prior or after its envisaged publication date.

¹⁸ When the envisaged date of publication is either advanced or delayed (see previous footnote), closure date(s) will be adjusted accordingly.

Technologies associated with the production, transformation and processing of knowledge-based multifunctional materials	
3.4.2.2-1 Advanced materials processing	CA
3.4.2.2-3 Multifunctional ceramic thin films with radically new properties	STREP
Engineering support for materials development	
3.4.2.3-1 Materials by design: multifunctional organic materials	STREP
3.4.2.3-2 Materials for solid state ionics	STREP
Development of new processes and flexible, intelligent manufacturing systems	
3.4.3.1-3 New concepts for global delivery	STREP
3.4.3.1-4 Roadmapping and foresight studies on the future of manufacturing (<i>Manufuture</i>)	SSA
3.4.3.1-5 Coordination of European Manufacturing Research Activities	CA
3.4.5.1 Basic materials and industrial process research on functional materials for fuel cells	STREP
3.4.5.2 Improved, energy efficient hydrogen storage systems especially for transport	STREP
3.4.5.3 Cooperation with Third Countries in the field of nanotechnology, advanced multi-functional materials and new ways of production research	SSA

9. Minimum number of participants:

Instrument	Minimum number of participants
STREP and CA	<u>3 independent legal entities from 3 different MS or AS, with at least 2 MS or ACC.</u>
SSA	<u>1 legal entity</u>

10. Restriction on participation: None.

11. Consortia agreements:

- Participants in STREP, CA and SSA resulting from this call are encouraged, but not required, to conclude a consortium agreement.

12. Evaluation procedure:

- For STREP, CA and SSA proposals, the evaluation shall follow a single stage procedure
- Proposals will not be evaluated anonymously.

13. Evaluation criteria:

- See Annex B of the work programme for the applicable criteria (including their individual weights and thresholds and the overall threshold) per instrument.
- Attention will be given to the relevance of the proposals with regard to the general objectives of priority 3 as well as the specific objectives described for each topics covered by the call.

14. Indicative evaluation and contractual timetable:

- Evaluation results: estimated to be available within 2 months after the closure date;
- Conclusion of first contracts: it is estimated that the first contracts related to this call will come into effect by early 2006.

Call fiche – Third call for IPs for SMEs in priority 3 :

- 1. Specific Programme:** Integrating and strengthening the European Research Area
- 2. Activities:** Priority Thematic Area of research “Nanotechnology, ... processes and devices”
- 3. Call title:** Dedicated call for IPs for SMEs in the area of “Nanotechnology, ... processes and devices”
- 4. Call identifier:** FP6-2004-NMP-SME-4
- 5. Date of publication**¹⁹: December 8, 2004
- 6. Closure date(s)**²⁰: For Integrated project (IP) (1st stage), **17 March 2005** at 17.00 (Brussels local time);
- 7. Total indicative budget:** 100 M € (*)

Instrument	€ (millions)
IP	100

(*) *Considering the indicative budget available for this call, about 20 proposals are expected to be supported.*

8. Areas called and Instruments:

Area	Instrument
3.4.4.4 Multi-functional technical textiles for construction, medical applications and protective clothing	IP dedicated to SMEs
3.4.4.5 Simultaneous engineering and production of integrated high-tech components for European transport	IP dedicated to SMEs
3.4.4.6 Biomaterials technologies for implants	IP dedicated to SMEs
3.4.4.7 Nanotechnological approaches for improved security systems	IP dedicated to SMEs

9. Minimum number of participants:

Instrument	Minimum number of participants
IP dedicated to SMEs	<u>3 independent legal entities from 3 different MS or AS, with at least 2 MS or ACC.</u>

10. Restriction on participation: Proposals should be clearly led by SMEs (see also section 3.6.5).

11. Consortia agreements:

- Participants in IP are required to conclude a consortium agreement.

12. Evaluation procedure:

- For IP dedicated to SMEs, the evaluation shall follow a two-stage procedure. An outline proposal (stage 1) of a maximum of 20 pages (font size 12), addressing only a reduced set of the evaluation criteria, i.e.: relevance, potential impact and S/T excellence, shall be submitted at the closure date mentioned under item n°6 above. Proposals having passed the minimum thresholds (12 out of 15) required in the first stage will be retained for the second stage (“go” proposals). Coordinators of “go” proposals will be requested to provide a complete proposal, which will be then evaluated against all set of evaluation criteria. The evaluation procedure will include ‘hearings’. The closure date for that second submission shall be mentioned in the request (indicative closure date: **15 September 2005**).

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

²⁰ When the envisaged date of publication is either advanced or delayed (see previous footnote), closure date(s) will be adjusted accordingly.

- Proposals will not be evaluated anonymously.

13. Evaluation criteria:

- See Annex B of the work programme for the applicable criteria (including their individual weights and thresholds and the overall threshold) per instrument.

14. Indicative evaluation and contractual timetable:

- Evaluation results: estimated to be available within 2 months after the closure date;
- Conclusion of first contracts: it is estimated that the first contracts related to this call will come into effect by early 2006.

Annex A: Overview of Calls for Proposals foreseen in this Work Programme (see relevant work programme part for details) - SP1

1. Life sciences, genomics and biotechnology for health	<ul style="list-style-type: none"> (i) FP6-2002-Lifescihealth - publication 17/12/2002; closure 25/03/2003; budget 513 M€ (ii) FP6-2003-Lifescihealth-I - publication 15/07/2003; closure 13/11/2003; budget 411 M€ (iii) FP6-2003-Lifescihealth-II - publication 15/07/2003; closure 15/04/2004; budget 4 M€ (iv) FP6-2003-Lifescihealth-3 - publication 13/12/2003; closure 24/03/2004; budget 12 M€ (v) FP6-2004-Lifescihealth-4 - publication 15/06/2004; closure 09/09/2004; budget 4M€ (vi) FP6-2004-Lifescihealth-5 - publication 15/06/2004; closure 17/11/2004; budget 540M€
2. Information Society technologies	<ul style="list-style-type: none"> (i) FP6-2002-IST-1- publication 17/12/2002; closure 24/04/2003; budget 1070 M€ (ii) FP6-2002-IST-FET Open domain-publication 17/12/2002; closing 31/12/2004; budget 60 M€ (iii) FP6-2002-IST-NMP-1 (joint) - publication 17/12/2002; closing 24/04/2003; budget 60 M€ (iv) FP6-2002-IST-2- publication 17/06/2003; closure 15/10/2003; budget 525 M€ (v) FP6-2004-IST-3- publication 8/06/2004; closure 22/09/2004; budget 28 M€ (vi) FP6-2004-IST-NMP-2 (joint) - publication 8/06/2004; closing 14/10/2004; budget 180 M€ (vii) FP6-2004-IST-FET Proactive initiatives-publication 8/06/2004; closing 22/09/2004; budget 80 M€ (viii) FP6-2004-IST-4 - publication 16 Nov 2004; closure 22/03/2005; budget 1120 M€ (ix) FP6-2004-IST-5 - publication 17 May 2005; closure 21/09/2005; budget 638 M€ (x) FP6-2004-IST-C publication Nov 2004; closure 20/09/2005; budget 60 M€
3. Nano-technologies and nano-sciences, knowledge-based multifunctional materials, and new production processes and devices	<ul style="list-style-type: none"> (i) FP6-NMP-1- publication 17/12/2002; closures 6/03/2003 and 10/04/2003; budget 400 M€ (ii) FP6-2002-IST-NMP-1-(joint) publication 17/12/2002; closing 24/04/2003; budget 60 M€ (iii) FP6-NMP-2- publication 17/12/2002; closure 10/04/2003; budget 40 M€ (iv) FP6-2003-NMP-NI-3- publication 13/12/2003; closure 02/03/2004; budget 245 M€ (v) FP6-2003-NMP-TI-3- publication 13/12/2003; closure 12/05/2004; budget 105 M€ (vi) FP6-2003-NMP-SME-3- publication 13/12/2003; closure 02/03/2004; budget 80 M€ (vii) FP6-2002-STEEL-3(joint) - publication 13/12/2003; closing 17/03/2004; budget 25 M€ (with 20 M€ from FP6, the balance from the Research Fund for Coal and Steel) (viii) FP6-2004-IST-NMP-2 (joint) - publication 8/06/2004; closing 14/10/2004; budget 180 M€ (ix) FP6-2004-NMP-NSF-1 - publication 8 June 2004; closing 14/10/2004; budget 6 M€ (x) FP6-2004-NMP-NI-4 - publication Dec 2004; closing 17/03/2005; budget 150 M€ (xi) FP6-2004-NMP-TI-4 - publication Dec 2004; closing 15/09/2005; budget 120 M€ (xii) FP6-2004-NMP-SME-4 - publication Dec 2004; closing 17/03/2005; budget 100 M€
4. Aeronautics and space	<ul style="list-style-type: none"> (i) FP6-Aero-1- publication 17/12/2002; closure 20/03/2003; budget 240 M€ (ii) FP6-Aero-2- publication 17/12/2002; closure 20 March 2003 and 23 September 2003; budget 7 M€ (iii) FP6-2002-TREN-1 (joint)-publication 17/12/2002; closures 18,20/03/2003 and 15/04/2003; budget 140 M€ (iv) FP6-2003-TREN-2 (joint)-publication 17/06/2003 closure 17/12/2003; budget 175 M€ (v) FP6-2002-Space-1- publication 17/12/2002; closure 20/03/2003; budget 60 M€ (vi) FP6-2003-Aero-1- publication 13/12/2003; closure 31/3/2004; budget 300 M€ (vii) FP6-2003-Aero-2 - publication 13/12/2003; closure 31/3/2004, and 28/9/2004; budget 7 M€ (viii) FP6-2003-Space-1 - publication 13/12/2003; closure 31/3/2004; budget 60 M€ (ix) FP6-2003-TREN-3 (joint)- publication 8/06/2004; closure 8/12/2004; budget 252 M€ (x) FP6-2004-Hydrogen-1 (joint) - publication 8/06/2004; closure 8/12/2004; budget 35 M€ (xi) FP6-2004-Hydrogen-2 (joint) - publication 8/06/2004; closure 8/12/2004; budget 4.5 M€
5. Food quality and safety	<ul style="list-style-type: none"> (i) FP6-2002-Food-1 - publication 17/12/2002; closure 15/04/2003; budget 204 M€ (ii) FP6-2003-Food-2A & B - publication 5/11/2003; closures 5/02/2004 and 29/09/2004.; budget 197 M€ (iii) FP6-2004-Food-3-A - publication 24/7/2004; closure 7/10/2004; budget 152 M€ (iv) FP6-2004-Food-3-B - publication 24/7/2004; closure 8/02/2005; budget 59 M€ (v) FP6-2004-Food-3-C - publication 24/7/2004; closure 7/09/2005; budget 5 M€

6.Sustainable development, global change and ecosystems	<p>(a) Sustainable Energy Systems: (i) FP6-2002-TREN-1(joint)-publication 17/12/2002; closures 18,20/03/2003 and 15/04/2003; budget 140 M€ (ii) FP6-2002-Energy 1- publication 17/12/2002; closure 18/03/2003; budget 198 M€ (iii) FP6-2003-TREN-2(joint)- publication 17/06/2003; closure 17/12/2003; budget 175 M€ (iv) FP6-2003-Energy-2- publication 4/10/2003; closure 17/12/2003; budget 3 M€ (v) FP6-2003-TREN-3 (joint)- publication 8/06/2004; closure 8/12/2004; budget 252 M€ (vi) FP6-2004-Hydrogen-1 (joint) - publication 8/06/2004; closure 8/12/2004; budget 35 M€ (vii) FP6-2004-Hydrogen-2 (joint) - publication 8/06/2004; closure 8/12/2004; budget 4.5 M€ (viii) FP6-2004-Energy-3 - publication 8/09/2004; closure 8/12/2004; budget 190 M€</p> <p>(b) Sustainable surface transport: (i) FP6-2002-TREN-1(joint)-publication 17/12/2002; closures 18,20/03/2003 and 15/04/2003; budget 140 M€ (ii) FP6-2003-TREN-2 (joint)-publication 17/06/2003 closure 17/12/2003; budget 175 M€ (iii) FP6-2002-Transport 1- publication 17/12/2002; closure 15/04/2003; budget 170 M€ (iv) FP6-2002-Transport 2- publication 17/12/2002; closure 3 April 2003 and 23 September 2003, budget 5 M€ (v) FP6-2003-Transport-3 - publication 13/12/2003; closure 6/4/ 2004; budget 150 M€ (vi) FP6-2003-Transport-2 - publication 13/12/2003; closure 6/4/2004 and 22 September 2004; budget 5 M€ (vii) FP6-2003-TREN-3 (joint)- publication 8/06/2004; closure 8/12/2004; budget 252 M€ (viii) FP6-2004-Hydrogen-1 (joint) - publication 8/06/2004; closure 8/12/2004; budget 35 M€ (ix) FP6-2004-Hydrogen-2 (joint) - publication 8/06/2004; closure 8/12/2004; budget 4.5 M€</p> <p>(c) Global change and ecosystems: (i) FP6-2002-Global 1-publication 17/12/2002; closure 8/4/2003; budget 170 M€ (ii) FP6-2003-Global 2-publication 3/07/2003; closure 9 October 2003 and 17 February 2004; budget 180 M€ (iii) FP6-2004- Global 3-publication 16/06/2004; closure 26 October 2004; budget 205 M€</p>
7. Citizens and governance in a knowledge-based society	<p>(i) FP6-2002-Citizens 1-publication 17/12/2002; closure 15/04/2003; budget 20 M€ (ii) FP6-2002-Citizens 2-publication 17/12/2002; closure 15/04/2003, budget 33 M€ (iii) FP6-2002-Citizens 3-publication 17/12/2002; closure 10/12/2003; budget 48 M€ (iv) FP6-2002-Citizens-4-publication 8/12/2004; closure 13/04/2005; budget 60 M€ (v) FP6-2002-Citizens-5-publication 8/12/2004; closure 13/04/2005; budget 52 M€ (vi) FP6-2002-Citizens-6-publication 8/12/2004; closure 13/04/2005; budget 4 M€</p>
8. Policy support and anticipating scientific and technological needs	<p>(a) Policy-oriented research: (i) FP6-2002-SSP 1 - publication 17/12/2002; closure 13/03/2003; budget 149.1 M€ (ii) FP6-2003-SSP-SARS 1 - publication 3/7/2003; closure 30/09/2003; budget 9 M€ (iii) FP6-2003-SSP3 - publication 4/10/2003; closure 5/01/2004; budget 83.1 M€ (iv) FP6-2004-SSP-4 - publication 28 Oct 2004; closure 1/2/2005; budget 77.8 M€</p> <p>(b) New and Emerging S&T problems and opportunities: (i) FP6-2003-NEST-A-publication 26/02/2003; closure 22/10/2003; budget 28M€ (ii) FP6-2003-NEST-B1, B2, B3, B4 - publication 17/12/2003; closure 14/4/2004 and 15/9/2004; budget 30M€ (iii) FP6-2003-NEST-Path - publication 17/12/2003; closure 14/4/2004; budget 35M€ (iv) FP6-2004-NEST-Path - publication 01/12/2003; closure 13/4/2005; budget 35M€ (v) FP6-2004-NEST-C1, C2, C3, C4 - publication 01/12/2003; closure 13/4/2005; budget 30M€</p>
9. Horizontal research activities involving SMEs	<p>(i) FP6-2002-SME 1-publication 17/12/2002; closure 27/11/2003; budget 155 M€ (ii) FP6-2002-SME 2-publication 17/12/2002; closure 6/03/2003; budget 40 M€ (iii) FP6-2003-SME 1-publication 17/12/2002; closure 21/10/2004; budget 75 M€ (iv) FP6-2003-SME 2-publication 17/12/2003; closure 6/04/2004; budget 41 M€ (v) FP6-2003-SME 3-publication 17/12/2003; closure 6/04/2004; budget 2 M€ (vi) FP6-2004-SME-COOP-publication 15/12/2004; closure 14/09/2005; budget 75 M€ (vii) FP6-2004-SME-COLL-publication 15/12/2004; closure 26/05/2005; budget 65 M€</p>

10. Specific measures in support of international co-operation	<p>(i) FP6-2002-INCO- DEV 1- publication 17/12/2002; closure 11/09/2003, budget 50 M€</p> <p>(ii) FP6-2002-INCO- MPC 1-publication 17/12/2002; closure 7/05/2003; budget 25 M€</p> <p>(iii) FP6-2002-INCO- WBC1-publication 17/12/2002; closure 7/05/2003, budget 13.5 M€</p> <p>(iv) FP6-2002-INCO- DEV/SSA 1 - published 17/12/2002; open call; final closure 6/03/2006; budget 1 M€ for 2003, 1.9 M€ for 2004</p> <p>(v) FP6-2002-INCO- MPC/SSA 2 - published 17/12/2002; open call; final closure 6/03/2006; budget 0.6 M€ for 2003, 0.9 M€ for 2004</p> <p>(vi) FP6-2002-INCO- WBC/SSA3 - published 17/12/2002; open call; final closure 6/03/2006; budget 0.6 M€ for 2003, 0.9 M€ for 2004</p> <p>(vii)FP6-2002-INCO-Russia+NIS/SSA-4 - published 17/12/2002; open call; final closure 6/03/2006; budget 0.6 M€ for 2003, 0.9 M€ for 2004</p> <p>(viii) FP6-2002-INCO-COMultilatRTD/SSA 5 - published 17/12/2002; open call; final closure 6/03/2006; budget 0.6 M€ for 2003, 1.5 M€ for 2004</p> <p>(ix) FP6-2003-INCO-DEV-2 - publication 17/12/2003; closure 14/09/2004, budget 36.2 M€</p> <p>(x) FP6-2003-INCO-MPC-2 - publication 17/12/2003; closure 14/9/2004; budget 27.1 M€</p> <p>(xi) FP6-2003-INCO-Russia+NIS-1 - publication 17/12/2003; closure 27/4/2004, budget 14 M€</p> <p>(xii) FP6-2004-INCO-DEV-3 - publication 17/12/2004; closure 13/9/2005, budget 60 M€</p> <p>(xiii) FP6-2004-INCO-MPC-3 - publication 17/12/2004; closure 13/9/2005, budget 10 M€</p> <p>(xiv) FP6-2004-INCO-WBC-SSA-3- publication 17/12/04; closure 07/03/2005, budget 3 M€</p>
11. Support for the co-ordination of activities	(i) FP6-2002-ERA-NET-1-CA-SSA - publication 17/12/2002; open call; final closure 4/10/2005; budget, 71 M€ for 2004, and 58.6 M€ for 2005
12. Support for the coherent development of policies	(i) FP6-2005-KNOW-REG-2 - publication 01/12/04; closure 02/05/2005, budget 8 M€
D. Promotion of co-operation with Associated Candidate Countries: "Reinforcement of the Associated Candidate Countries' Research Capacities"	<p>(i) FP6-2003-ACC-SSA-General - publication 26/03/2003; closure 26/06/2003, budget 9 M€</p> <p>(ii) FP6-2003-ACC-SSA-NMP; FP6-2003-ACC-SSA-Aero-Space; FP6-2003-ACC-SSA-Food; FP6-2003-ACC-SSA-Energy;</p> <p>(iii) FP6-2003-ACC-SSA-Transport - publication 26/03/2003; closure 26/06/2003, budget up to 4 M€</p> <p>(iv) FP6-2004-ACC-SSA-2 - publication 15/06/2004; closure 14/10/2004, budget 19.8 M€</p>
E. Promotion of co-operation with targeted third countries	(i) FP6-2004-TC-SSA-General - publication 15/06/2004; closure 14/10/2004, budget 2.9 M€

Annex B: Common evaluation criteria for evaluating proposals

Common evaluation criteria for evaluating proposals

A number of evaluation criteria are common to all the programmes of the Sixth Framework Programme and are set out in the European Parliament and the Council Regulations on the Rules for Participation (Article 10). These are:

- a) “Scientific and technological excellence and the degree of innovation;
- b) Ability to carry out the indirect action successfully and to ensure its efficient management, assessed in terms of resources and competences and including the organisational modalities foreseen by the participants;
- c) Relevance to the objectives of the specific programme;
- d) European added value, critical mass of resources mobilised and contribution to Community policies;
- e) Quality of the plan for using and disseminating the knowledge, potential for promoting innovation, and clear plans for the management of intellectual property.”

Furthermore, in applying paragraph (d) above, the following criteria are also to be taken into account:

- a) “For networks of excellence, the scope and degree of the effort to achieve integration and the network’s capacity to promote excellence beyond its membership, as well as the prospects of the durable integration of their research capabilities and resources after the end of the period covered by the Community’s financial contribution;
- b) For integrated projects, the scale of the ambition of the objectives and the capacity of the resources to make a significant contribution to reinforcing competitiveness or solving societal problems;
- c) For integrated initiatives relating to infrastructure, the prospects of the initiative’s continuing long term after the end of the period covered by the Community’s financial contribution.”

As set out in the Rules for Participation, the calls for proposals determine, in accordance with the type of instruments deployed or the objectives of the RTD activity, how the criteria set out above are applied by the Commission.

The purpose of this annex is to indicate how these criteria shall be applied. In particular, as the Sixth Framework Programme contains a differentiated set of instruments, the way in which each criterion translates into the issues to be examined as the basis for marking proposals will differ. In evaluating against these criteria, the checklists of issues set out in the following pages are intended to be universal for each type of instrument.

Unless otherwise specified in the relevant parts of this work programme, the principal issues set out below (i.e. the main numbered headings) will be given equal weighting in the evaluation. For each principal issue, a minimum score to be achieved is also indicated as well as a minimum overall score for each instrument. Proposals that fail to achieve these minimum threshold scores shall be rejected. Any departures from these threshold scores are indicated in the relevant part of this work programme.

In addition to the basic checklists below and any specific criteria or interpretations of the criteria required for a call, the following issues are also addressed for all proposals at any appropriate moment in the evaluation:

- Are there **gender** issues associated with the subject of the proposal? If so, have they been adequately taken into account?
- Have the applicants identified the potential **ethical** and/or **safety** aspects of the proposed research regarding its objectives, the methodology and the possible implications of the results? If so, have they been adequately taken into account in the preparation of the proposal?

An ethical check will take place for all proposals during the evaluation. A specific ethical review will be implemented following the evaluation for proposals recommended for funding and which deal with specific sensitive issues or whenever recommended following the ethical check during the evaluation. To this end, additional information on ethical aspects may be requested from proposers to allow the specific ethical review to be carried out. (See the section “The ethical review of proposals” below for more details on the criteria to be applied).

When appropriate, the following additional issues may also be addressed during the evaluation:

- To what extent does the proposal demonstrate a readiness to engage with actors beyond the research community and the public as a whole, to help spread awareness and knowledge and to explore the wider **societal implications** of the proposed work?
- Have the synergies with **education** at all levels been clearly set out?
- If **third country participation** is envisaged in the proposal, is it well justified and the participation well integrated in the activities?

Specific Targeted Research Projects

The following set of issues is intended to be a common basis for the evaluation of proposals for (1) Specific Targeted Research Projects.

1. Relevance (threshold score 3 out of 5)

- The extent to which the proposed project **addresses the objectives** of the work programme.

2. S&T excellence (threshold score 4 out of 5)

The extent to which:

- the project has clearly **defined and well focused objectives**.
- the objectives represent **clear progress beyond the current state-of-the-art**.
- the **proposed S&T approach** is likely to enable the project to achieve its objectives in research and innovation

3. Potential impact (threshold score 3 out of 5)

The extent to which:

- the proposed project is likely to have an **impact on reinforcing competitiveness or on solving societal problems**.
- the proposal demonstrates a clear **added value** in carrying out the work at European level and takes account of research activities at national level and under European initiatives (e.g. Eureka).
- exploitation and/or dissemination plans are adequate to ensure **optimal use of the project results**.

4. Quality of the consortium (threshold score 3 out of 5)

The extent to which:

- the participants collectively constitute a **consortium of high quality**.
- the participants are **well-suited and committed to the tasks** assigned to them.
- there is **good complementarity** between participants.
- the opportunity of involving SMEs has been adequately addressed.

5. Quality of the management (threshold score 3 out of 5)

The extent to which:

- the **project management** is demonstrably of high quality.
- there is a satisfactory plan for the **management of knowledge**, of intellectual property and of other innovation-related activities.

6. Mobilisation of resources (threshold score 3 out of 5)

The extent to which:

- the project foresees the **resources** (personnel, equipment, financial...) necessary for success.
- the **resources** are **convincingly integrated** to form a coherent project.
- the overall **financial plan** for the project **is adequate**.

Overall threshold score 21 out of 30.

Coordination Actions

The following set of issues is intended to be a common basis for the evaluation of proposals for coordination actions.

1. Relevance (threshold score 3 out of 5)

- The extent to which the proposed project **addresses the objectives** of the work programme.

2. Quality of the coordination (threshold score 4 out of 5)

The extent to which:

- the research actions/programmes to be coordinated are of **demonstrably high quality**.
- the **coordination mechanisms** proposed are sufficiently **robust** for ensuring the goals of the action

3. Potential impact (threshold score 3 out of 5)

The extent to which:

- the proposal demonstrates a clear **added value** in carrying out the work at European level and takes account of research activities at national level and under European initiatives (e.g. Eureka).
- the Community support would have a real impact on the action and its scale, ambition and outcome.
- the project mobilises a critical mass of resources in Europe
- exploitation and/or dissemination plans are adequate to ensure **optimal use of the project results**, where possible beyond the participants in the project.

4. Quality of the consortium (threshold score 3 out of 5)

The extent to which:

- the participants collectively constitute a **consortium of high quality**.
- the participants are **well-suited to the tasks** assigned to them.
- the project combines the **complementary expertise** of the participants to generate added value with respect to the individual participants' programmes.

5. Quality of the management (threshold score 3 out of 5)

The extent to which:

- the **project management** is demonstrably of high quality.
- there is a satisfactory plan for the **management of knowledge**, of intellectual property and of other innovation-related activities.

6. Mobilisation of resources (threshold score 3 out of 5)

The extent to which:

- the project provides for the **resources** (personnel, equipment, financial...) necessary for success.
- the **resources** are **convincingly integrated** to form a coherent project.
- the overall **financial plan** for the project **is adequate**.

Overall threshold score 21 out of 30.

Specific Support Actions

The following set of issues is intended to be common to all parts of FP6 for the evaluation of proposals for specific support actions.

1. Relevance (threshold score 4 out of 5)

The extent to which

- the proposal addresses key issues to defined in the work programme/call, specific programmes or ERA, as appropriate.

2. Quality of the support action (threshold score 3 out of 5)

The extent to which:

- the proposed objectives are sound and the proposed approach, methodology and work plan are of a sufficiently high quality for achieving these objectives.
- the applicant(s) represent(s) a high level of competence in terms of professional qualifications and/or experience.
- the proposed activities are innovative and original (*if applicable*).

3. Potential impact (threshold score 3 out of 5)

The extent to which:

- the impact of the proposed work can only be achieved if carried out at European level.
- the Community support would have a substantial impact on the action and its scale, ambition and outcome.
- exploitation and/or dissemination plans are adequate to ensure **optimal use of the project results**, where possible beyond the participants in the project.

4. Quality of the management (threshold score 3 out of 5)

- The extent to which the management structure is credible in terms of professional qualifications, experience, track record and capacity to deliver.

5. Mobilisation of resources (threshold score 3 out of 5)

The extent to which :

- the project provides for the **resources** (personnel, equipment, financial...) necessary for success.
- the overall **financial plan** for the project **is adequate**.

Overall threshold score 17.5 out of 25.

The ethical review of proposals

In accordance with Article 3 of the Framework Programme and Article 10 of the Rules for Participation, the evaluation procedure includes a check of any ethical issues raised by proposals. A specific ethical review of proposals involving sensitive ethical issues may take place after the evaluation and before any selection decision by the Commission. For this purpose, an ethical review (ER) panel may be convened.

The ER panel assesses the following elements:

- The awareness of the proposers of the ethical aspects of the research they propose
- Whether the researchers respect the ethical requirements of the 6th Framework Programme. In this respect, a declaration to the minutes of the Council meeting of 30.09.2002 was made; this is set out at the end of this section.
- Whether the proposers have taken into account the legislation, regulations and/or guidelines in place in the country(ies) where the research takes place
- Whether the relevant international conventions and declarations are taken into account²¹
- Whether the relevant Community Directives are taken into account.
- Whether the proposer is seeking the approval/favourable opinion of relevant local ethics committees

For research involving human beings, the ER panel assesses in particular:

- The information which is given to the participants (healthy volunteers, tissue donors, patients, etc.)
- Measures taken to protect participants' personal data (including genetic data) and privacy
- Recruitment criteria and means by which the recruitment is to be conducted
- Level of care offered to participants

For research involving isolated or banked human embryonic stem cells in culture and foetal tissues and cells (for which restrictions apply, see the declaration to the Council minutes below) the ER panel assesses in particular:

- Whether the proposers have taken into account the legislation, regulations and/or codes of conduct in place in the country(ies) where the research using human embryonic stem cells in culture will take place. The procedures for obtaining informed consent
- The source of the human embryonic and foetal tissues/cells.
- Measures taken to protect personal data (including genetic data) and privacy
- The nature of financial inducements, if any.

²¹ Charter of Fundamental Rights of the European Union, signed in Nice, 7 December 2000
Convention on Human rights and Biomedicine – Oviedo, 4.04. 1997 - Council of Europe
and the Additional protocol on the prohibition of Cloning of human beings (1998)
Universal declaration on the Human genome and human rights - Unesco - 11 November 1997
Declaration of Helsinki (in its latest version) - World Medical Association
Convention on the Rights of the Child – United Nations - 20 November 1989
Amsterdam protocol on an animal protection and welfare

For research involving animals, the ER panel assesses in particular:

- Whether the proposers are applying the ‘Three Rs’ principle: Replacement, Reduction and Refinement, and in particular:
 - ◆ Are animal experiments replaced by alternatives whenever possible?
 - ◆ Is animal suffering avoided or kept to a minimum?
 - ◆ Is animal welfare guaranteed and are the principles of biodiversity respected?

With respect to research involving human embryonic stem cells (as mentioned above), the relevant declaration to the minutes of the Council meeting of 30 September 2002 is as follows:

“The Council and the Commission agree that detailed implementing provisions concerning research activities involving the use of human embryos and human embryonic stem cells which may be funded under the 6th Framework Programme shall be established by 31 December 2003. The Commission states that, during that period and pending establishment of the detailed implementing provisions, it will not propose to fund such research, with the exception of the study of banked or isolated human embryonic stem cells in culture. The Commission will monitor the scientific advances and needs as well as the evolution of international and national legislation, regulations and ethical rules regarding this issue, taking into account also the opinions of the European Group of Advisers on the Ethical Implications of Biotechnology (1991–1997) and the opinions of the European Group on Ethics in Science and New technologies (as from 1998), and report to the European Parliament and the Council by September 2003.

The Council states that it intends to discuss this issue at a meeting in September 2003.

In the review of any subsequent proposal submitted to Council when applying Article 5 of the Decision 1999/468/EC the Commission recalls its statement concerning Article 5 of Decision 1999/468/EC, according to which the Commission, in order to find a balanced solution, will act in such a way as to avoid going against any predominant position which might emerge within the Council against the appropriateness of an implementing measure (cf. OJ C 203, 17.7.1999, p. 1).

The Council notes the intention of the Commission to submit to the programme Committee, established under the specific Research programme "Integrating and strengthening the ERA", procedural modalities concerning research involving the use of human embryos and human embryonic stem cells, in accordance with Article 6, paragraph 3, first indent.

The Council further notes the intention of the Commission to present to Council and Parliament in Spring 2003 a report on human embryonic stem cell research which will form the basis for discussion at an inter-institutional seminar on bioethics.

Taking into account the seminar's outcome, the Commission will submit, based on article 166 (4) of the Treaty, a proposal establishing further guidelines on principles for deciding on the Community funding of research projects involving the use of human embryos and human embryonic stem cells.

The Council and the Commission will do their utmost, counting on the support of the European Parliament, to complete the legislative procedure as early as possible and at the latest in December 2003.

The Council and the Commission expect that the above mentioned seminar will contribute, as suggested by the European Parliament, to a Europe-wide and well-structured discussion process on the ethical issues of modern biotechnology, particularly on human embryonic stem cells, in order to enhance public understanding.

The Council and the Commission note that the ethical acceptability of various research fields is related to the diversity among Member States, and is governed by national law in accordance with the principle of subsidiarity. Moreover, the Commission notes that research using human embryos and human embryonic stem cells is allowed in several Member States, but not in others.”

Annex C : List of Groups of target countries for specific measures in support of International Co-operation

DEVELOPING COUNTRIES (ACP, ASIA, LATIN AMERICA)

- ACP

AFRICAN

- Angola
- Benin
- Botswana
- Burkina-Faso
- Burundi
- Cameroon
- Cape Verde
- Central African Republic
- Chad
- Comoros
- Congo (Republic)
- Congo (Democratic Rep. of)
- Côte d'Ivoire
- Djibouti
- Equatorial Guinea
- Eritrea
- Ethiopia
- Gabon
- Gambia
- Ghana
- Guinea
- Guinea-Bissau
- Kenya
- Lesotho
- Liberia
- Madagascar
- Malawi
- Mali
- Mauritania
- Mauritius
- Mozambique
- Namibia
- Niger
- Nigeria
- Rwanda
- Sao Tome and Principe
- Senegal
- Seychelles
- Sierra Leone
- Somalia
- South Africa
- Sudan
- Swaziland
- Tanzania
- Togo
- Uganda
- Zambia
- Zimbabwe

CARIBBEAN

- Antigua and Barbuda
- Bahamas
- Barbados
- Belize*
- Cuba*

- Dominica
- Dominican Rep.
- Grenada
- Guyana*
- Haiti
- Jamaica
- Saint Kitts and Nevis
- Saint Lucia
- Saint Vincent and Grenadines
- Suriname*
- Trinidad and Tobago

PACIFIC

- Cook Islands
- East Timor **
- Fiji
- Kiribati
- Marshall Islands
- Micronesia, Federal States of
- Nauru
- Niue
- Palau
- Papua New Guinea**
- Solomon Islands
- Tonga
- Tuvalu
- Vanuatu
- Western Samoa

- ASIA

- Bangladesh
- Bhutan
- Brunei
- Cambodia
- China***
- India***
- Indonesia
- Lao (People's Democratic Rep. of)
- Malaysia
- Maldives
- Mongolia
- Nepal
- Pakistan
- Philippines
- Singapore
- Sri Lanka
- Thailand
- Vietnam

- LATIN AMERICA

- Argentina
- Bolivia
- Brazil
- Chile
- Colombia
- Costa Rica
- Ecuador
- El Salvador
- Guatemala
- Honduras
- Mexico
- Nicaragua
- Panama
- Paraguay

- Peru
- Uruguay
- Venezuela

MEDITERRANEAN PARTNER COUNTRIES¹

- Algeria
- Egypt
- Jordan
- Lebanon
- Morocco
- Syrian Arab Rep.
- Tunisia
- West Bank and Gaza Strip

RUSSIA AND THE OTHER NEW INDEPENDENT STATES

- Armenia
- Azerbaijan
- Belarus
- Georgia
- Kazakhstan
- Kyrgyzstan
- Moldova
- Russia **
- Tajikistan
- Turkmenistan
- Ukraine
- Uzbekistan

WESTERN BALKAN COUNTRIES

- Albania
- Bosnia-Herzegovina
- Croatia
- Former Yugoslav Republic of Macedonia (FYROM)
- Serbia and Montenegro²

*For participation in the « Specific measures in support of international co-operation », these countries can be considered both in ACP and Latin American region

**For participation in the « Specific measures in support of international co-operation », these countries can be considered both in ACP and Asian regions

***For participation in the « Specific measures in support of international co-operation » China, India and Russia may be considered individually as a region, however, in this case, at least 3 different partners from different provinces or states within China, India or Russia are necessary

¹ Mediterranean partner countries are the 12 countries involved in the Barcelona process: Algeria, Cyprus, Egypt, Israel, Jordan, Lebanon, Malta, Morocco, Syrian Arab republic, Tunisia, Turkey, West bank and Gaza strip. However, Cyprus, Malta, Turkey and Israel are now associated countries to FP6

² Including Kosovo as defined by UNSC resolution 1244 of 10 June 1999