COMMISSION OF THE EUROPEAN COMMUNITIES

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INFORMAL DRAFT VERSION
PENDING A FINAL AGREEMENT ON THE FINANCIAL PERSPECTIVES
AND SUBJECT TO SUBSEQUENT ADOPTION BY THE EUROPEAN COMMISSION

Revised proposal for a

DECISION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

concerning the seventh framework programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Revised proposal for a

COUNCIL DECISION

concerning the seventh framework programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities (2007 to 2011)

BUILDING THE EUROPE OF KNOWLEDGE

(presented by the Commission)

EXPLANATORY MEMORANDUM (EC)

1. Context of the proposal

The proposals for the EC 7th Framework Programme and five Specific Programmes[1] have been revised from the Commission's original proposals[2] to take account of the reduced budget for the Financial Perspectives 2007-13. Compared to the Commission's original proposals this represents a reduction of approximately 30% in the budget over the period 2007-13.

Community level funding of research has been recognised by the Council and Parliament as having a unique importance for the creation of a knowledge economy and society. Within the agreed Community budget, research spending will increase by 75% in real terms in 2013 from the amount spent in 2006. The average annual budget will be approximately 60% higher than in the 6th Framework Programme and marks a significant expansion in Community funded research activities. On this basis the proposed 7th Framework Programme will have substantial economic, social and environmental benefits for Europe. At the same time, the reduced budget represents a missed opportunity to address Europe's needs and achieve the objectives to the extent set out in the original Commission proposals. This issue should be a key element in the review of the financial perspectives in 2009.

The objectives which the initial proposals sought to achieve are of increasing importance.[3] Research investment in Europe is slipping further behind major competitors, yet the need for new knowledge is critical for the jobs and industries of the future and for addressing the challenges of sustainable development. Furthermore, the original Commission proposals have received a wide level of support from the other European Institutions, researchers, industry, research users and other stakeholders. Given the relevance of the objectives, the Commission has maintained the structure and philosophy of the initial proposals while focusing the available budget in order to maximise impacts and to leverage and complement other sources of funding for research. In this respect, increasing research investments by national governments and the private sector towards the objective of 3% of GDP is more important than ever.[4]

The attached proposals represent an intermediate stage in advance of the Commission's revised proposal which will follow the Council's common position. Substantial progress has been achieved in the inter-institutional debate on the Framework Programme and Specific Programme decisions. In November 2005, the Council agreed a Partial General Agreement on the 7th Framework Programme. Extensive debate is ongoing in the Parliament, although no definitive opinions have yet been reached. The Economic and Social Committee and the Committee of Regions have both adopted opinions on the 7th Framework Programme proposals. All of this debate demonstrates a broad degree of consensus following the Commission's original proposals and a strong basis for timely decisions by the Council and Parliament on the 7th Framework Programme. In order to facilitate this debate as much as possible and allow the Parliament and Council to continue their deliberations, the revised proposals focus on those aspects which require modification to accommodate the reduced budget. Some minor changes have also been introduced to ensure consistency between the proposals and provide necessary clarifications. Limiting the revisions in this way will allow

[1] The Specific Programme proposals are not included at this stage.
[2] COM(2005)119; COM(2005)439; COM(2005)440; COM(2005)441; COM(2005)442; COM(2005)443
[3] As set out in *Building the ERA of Knowledge*, COM(2005) 118
[4] A comprehensive set of actions is laid out in *An action plan to boost research and innovation*, COM (2005)488

the Council, the Parliament and the consultative committees to capitalise on their work so far and to avoid revisiting agreed positions on aspects which do not relate to the budget related changes. The Commission will continue to act constructively to facilitate agreements as soon as possible and will respond formally to the Council and Parliament's amendments following the adoption of a Common Position on the 7th Framework Programme.

2. Prior consultation and impact assessment

Extensive analysis and stakeholder consultations were undertaken for the development of the initial Commission proposals and were presented in the Impact Assessment that accompanied the 7th Framework Programme proposal[5]. The results in terms of the added value of increased Community level investment in research and the proposed objectives and approach of the 7th Framework Programme remain valid for the revised proposal. However, the extent of the impacts will be less given the reduced budget available, and to achieve the desired level of impact will require stronger R&D efforts on the part of Member States, with more effective coordination between the EU, national and regional levels.

3. Legal aspects

The proposal for the EC Framework Programme is based on Chapter XVIII of the Treaty, Articles 163 to 171.

The proposed Framework Programme is proportional to the needs and objectives, and has been revised to maximise complementarity with Member State activities in line with the principle of subsidiarity. The 7th Framework Programme is designed to have strong links to other Community programmes supporting the knowledge economy and society, in particular the proposed Structural Funds, the new Competitiveness and Innovation Programme, and the educational programmes for 2007-13.

4. Budgetary implication

The "legislative financial statement" attached to this Decision sets out the budgetary implications and the human and administrative resources.

An executive agency is initially foreseen for the implementation of the "Ideas" specific programme. The executive agency model may also be used during implementation for some aspects of other specific programmes for indirect actions.

5. Content of Revised Proposal

The revised proposals maintain the same structure, objectives and philosophy of the Commission's original proposals. This reflects the vital importance of the objectives, and the need to minimise the adverse consequences of the reduction in budget and to build on the strong level of support and consensus for the original proposals. The overall objective of each specific programme has been maintained, as have the objectives of each thematic area in the Cooperation specific programme and each part of the Capacities specific programme. Simplification of the implementation of the 7th Framework Programme remains of paramount importance.

[5] SEC(2005)430

The reduction in budget does, however, require a substantial revision in the 7th Framework Programme proposals and their implementation:

- A revised budgetary breakdown to maximise the use of the available amount, maintain necessary critical mass and respect existing commitments.

- Fewer large scale initiatives (Joint Technology Initiatives; Article 169 Initiatives; new research infrastructures), taking account of their state of preparedness and the strength of commitment of stakeholders.

- Greater prioritisation in the scientific and technological content, while maintaining the necessary flexibility for a 7 year programme.

5.1 Revised budgetary breakdown

The indicative budgetary breakdown between and within the specific programmes in the revised proposals respect the balances that were established in the original proposals. Such balances include: between continuity with the 6th Framework Programme on the one hand and new approaches on the other, between strengthening research excellence and investing in the capacities for excellence, between industry relevant research and research addressing policy or societal needs; and between funding with predefined priorities and opportunities for applicants to propose topics.

The Cooperation specific programme remains at the core of the 7th Framework Programme, accounting for the majority of the budget proposed. At the same time sufficient funding is allocated to the proposed European Research Council to be established as an important "flagship" for the future of European research.

The broad balance of funding between and within specific programmes has been respected. Some adjustments have been made to maintain critical mass and to take account of prior commitments.[6] The need for critical mass applies in particular to the European Research Council to be established under the Ideas specific programme which must achieve the necessary European dimension. It also applies to some parts of the original proposal that had relatively small budget allocations in the initial proposal. Within the Capacities specific programme, new actions such as Research Potential will be introduced more gradually.

The proposed financial contribution from the Cooperation and Capacities specific programmes to the Risk Sharing Finance Facility will leverage a substantially greater volume of loan financing for research projects and infrastructure. The Community contribution to the Risk Sharing Finance Facility is expected to be matched by greater financing of research from the EIB's own funds.

5.2 Approach for large-scale, multi-financed initiatives

A major novelty of the 7th Framework Programme is the introduction of large scale initiatives that combine a variety of sources of funding, namely the Joint Technology Initiatives, Article 169 initiatives, and new research infrastructure projects. While maintaining these initiatives in the proposal, the reduced budget requires a more selective approach to be taken which will rely heavily on the state of preparedness of the initiatives, the commitment of other sources of funding, and the ability to combine funding effectively so as to realise the objectives. Other

[6] Under the Euratom 7th Framework Programme, a significant commitment is the ITER project.

sources of funding that are of particular importance are from industry, from national and regional governments, from the Structural Funds, and from private finance including the European Investment Bank. In some cases, the reduced budget may require delaying the launch of large scale initiatives. The need for increased financing of large-scale research initiatives under the 7th Framework Programme should therefore be a key consideration in the review of the financial perspectives in 2009.

Joint Technology Initiatives (JTIs). The Commission remains committed to launching a number of JTIs as major public private partnerships that provide European leadership in key technologies for the future. Since the adoption of the initial proposals, extensive consultations have taken place with industry in the six areas identified, and substantial progress has been made in preparing for proposals under Article 171 decisions to establish the JTIs. However, with the reduced financial means available a more selective approach is required and the Commission will only present proposals for a limited number of JTIs and may need to stagger their introduction through the period of the 7th Framework Programme. Within the budget available, the Commission will put forward those JTIs where preparations are most advanced and where the added value of a JTI over what could be achieved through existing instruments is greatest. In this context, the financial and resource commitment from industry will be key.

Article 169 initiatives: The participation of the Community in jointly implemented national programmes under Article 169 should also be continued in the 7th Framework Programme, but in a more limited way than originally proposed. Three Article 169 initiatives were identified in the initial proposals for the Cooperation specific programme, and a further one in the Capacities specific programme. Given the reduced budget, the Commission will be more selective in deciding which areas should be proposed for Article 169 initiatives, and a key criterion in this respect will be the financial commitment of Member States. This criterion will also apply to future Community participation in the European and Developing Country Clinical Trials Partnership that was launched as an Article 169 initiative under the 6th Framework Programme.

Research infrastructures: Building on the work by the European Strategy Forum for Research Infrastructures (ESFRI) the Commission will identify priority projects, for which there is a critical need for an EC support and a strong commitment from Member States, under the 7th Framework Programme. For those projects the Commission will act as a facilitator, focusing its role on a catalytic and leveraging role, in particular in facilitating financial engineering mechanisms. Given the reduction in budget, it is expected that a greater proportion of funding towards new research infrastructures will be for preparatory work.

5.3 Approach for defining and implementing the scientific and technological content

In parts of the Framework Programme without predefined scientific and technical content, in particular the "Ideas", "People" and some parts of the "Capacities" specific programmes, the reduced budget does not require major changes in the proposed legislative decisions. In these cases, the reduction in budget will be accommodated:

– In the "Ideas", through a more measured start up period for the European Research Council but leading to a substantial critical mass of budgetary resources at the end of the period;

– In "People", by giving emphasis to those activities which will have the greatest impact and structuring effect, although it will not be possible to reduce the extent of oversubscription experienced in the 6th Framework Programme by as much as desired;

– In the International Cooperation part of "Capacities" by focusing support on priority setting such as to maximise the international cooperation research actions to be carried out under the Cooperation specific programme

Within "Cooperation" and some parts of "Capacities", the broad scientific and technological content is defined in the Specific Programme decisions. The reduced budget will have a major impact in terms of the depth and completeness which this content can be supported. The effect of the budget reduction is that greater prioritisation will be required in the implementation of the 7th Framework Programme. At the same time, it is vital to maintain sufficient flexibility such that new needs, opportunities and priorities can be accommodated during the 7 year period of implementation.

The necessary prioritisation will be undertaken, to a large extent, in the annual work programmes under these specific programmes which will target well-focused areas for calls for proposals. Furthermore, this will mean that funding of some topics will be delayed until later years. A number of minor changes are, however, also required in the description of the thematic content in the legislative proposals. In some cases this is to narrow the focus or prioritise within the existing scope. In other cases more detailed content and examples have been removed as the Commission cannot guarantee that all the particular examples and aspects of a particular area can be adequately supported. In a small number of cases, areas or topics have been removed as it is no longer considered possible for them to be funded.

6. Towards the launch of the 7th Framework Programme

The 7th Framework Programme will provide a major impetus towards the knowledge economy and society in Europe. In order to build on the achievements of the 6th Framework Programme, there should be no gap in funding with the transition to the 7th Framework Programme, which would adversely affect the European research community at a critical time and risk losing momentum in European research efforts.

The timely launch of the 7th framework Programme will require the commitment and constructive engagement of all parties.

The debate in the Council and Parliament must now accelerate, consolidating on the substantial progress that has been made since the original proposals were adopted in April 2005. The Commission, for its part, will do all it can to facilitate this debate and ensure the timely adoption of Council and Parliament decisions.

The stakeholders in large scale initiatives must demonstrate their commitment and preparedness and their ability to meet the established criteria, such that selected proposals can be put forward for Joint Technology Initiatives and Article 169 initiatives. Similar commitments will be needed for possible funding of new research infrastructures.

Simplification is of key importance, and the Commission will accelerate its preparations for the implementation of the Framework Programme, in close liaison with stakeholders, such that the necessary documents and guidance are available on time.

Throughout these endeavours the ongoing support and engagement of the research community and other stakeholders is critically important, such that their views are properly expressed and Europe can have a Framework Programme that truly meets its needs.

Revised proposal for a

DECISION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

concerning the seventh framework programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

ADDITIONS TO THE COMMISSION PROPOSAL COM(2005)119 ARE SHOWN IN UNDERLINING AND DELETIONS WITH ~~STRIKE THROUGH.~~

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 166(1) thereof,

Having regard to the proposal from the Commission[7],

Having regard to the opinion of the European Economic and Social Committee[8],

Having regard to the opinion of the Committee of the Regions[9],

Acting in accordance with the procedure laid down in Article 251 of the Treaty[10],

Whereas:

(1) The Community has the objective of strengthening the scientific and technological bases of the Community industry and to assure a high level of competitivity. To this end, the Community shall promote all the research activities deemed necessary, in particular by encouraging undertakings, including small and medium sized enterprises ("SMEs"), research centres and universities in their research and technological development activities.

(2) The central role of research in ensuring competitivity and economic growth was recognised by the European Council of Lisbon which highlighted knowledge and innovation as the heart of the economic progress, including growth of employment in Europe.

(3) In line with the Lisbon strategy, the European Council of Barcelona set the target of raising European research efforts to 3% of EU GDP, two thirds of which should come from private investment.

7 OJ C , , p. .
8 OJ C , , p. .
9 OJ C , , p. .
10 OJ C , , p. .

(4) The European Parliament has repeatedly stressed the importance of research, technological development and the increased role of knowledge for economic growth, most recently in its guidelines for future EU policy to support research of March 2005[11].

(5) Taking into account the research needs of all Community policies and building upon wide-spread support from European industry, the scientific community, universities, and other interested circles, the Community should establish the scientific and technological objectives to be achieved under its seventh Framework Programme in the period 2007 to 2013.

(6) These objectives should build upon the achievements of the sixth Framework Programme towards the creation of the European Research Area and carry them further towards the development of a knowledge-based economy and society in Europe. Among these objectives the following are particularly important:

(7) Trans-national cooperation at every scale across the EU should be supported.

(8) The dynamism, creativity and excellence of European research at the frontier of knowledge should be enhanced.

(9) The human potential in research and technology in Europe should be strengthened quantitatively and qualitatively.

(10) The research and innovation capacities throughout Europe should be enhanced and their optimal use should be ensured.

(11) In order to realise these objectives it is necessary to promote four types of activities: trans-national cooperation on policy-defined themes ("Cooperation"), investigator-driven research based on the initiative of the research community ("Ideas"), support of individual researchers ("People"), and support of research capacities ("Capacities").

(12) Under "Cooperation", support should be provided to trans-national co-operation at every scale across the European Union and beyond, in a number of thematic areas corresponding to major fields of the progress of knowledge and technology, where research should be supported and strengthened to address European social, economic, environmental and industrial challenges.

(13) Under "Ideas", activities should be implemented by a European Research Council ("ERC"), which should enjoy a high degree of autonomy.

(14) Under "People", individuals should be stimulated to enter into the researcher's profession, European researchers should be encouraged to stay in Europe, researchers from the entire world should be attracted to Europe and Europe should be made more attractive to the best researchers.

[11] Not yet published in the OJ.

(15) Under "Capacities", the use and development of research infrastructures should be optimised; innovative capacities of SMEs and their ability to benefit from research should be strengthened; the development of regional research-driven clusters should be supported; the research potential in the EU's convergence and outermost regions should be unlocked; science and society should be brought closer together for the harmonious integration of science and technology in European society; and horizontal actions and measures in support of international co-operation should be undertaken.

(16) The Joint Research Centre should contribute to the attainment of the objectives set out above by carrying out direct actions and by providing customer-driven support for the implementation of EU policies.

(17) The seventh Framework Programme complements the activities carried out in the Member States as well as other Community actions that are necessary for the overall strategic effort for the implementation of the Lisbon objectives, alongside in particular those on structural funds, agriculture, education, training, competitiveness and innovation, industry, employment and environment.

(18) Innovation and SME-related activities supported under this Framework Programme should be complementary to those undertaken under the framework programme for Competitiveness and Innovation.

(19) Given the widely supported enlarged scope of the Framework Programme actions, the leverage effect of funding in national and private investments, the need to enable the Community to meet new science and technology challenges, the vital role the Community intervention plays in making the European research system more efficient and effective, the contribution of a larger seventh Framework Programme to the reinvigoration of the Lisbon strategy, there is a pressing need to ~~double~~ **progressively increase** the EU research budget[12].

(20) Taking into account the mid-term review of the use of new instruments under the sixth Framework Programme and the Five Year Assessment of the Framework Programme, a new approach has been defined which should allow the political objectives of EU research policy to be reached more easily, more efficiently and in a more flexible way. To this end, a smaller set of simpler "funding schemes" should be used, alone or in combination, with more flexibility and freedom, to support the different actions.

(21) Since the objective of the actions to be taken in accordance with Article 163 of the Treaty in contributing towards the creation of a knowledge-based society and economy in Europe cannot be sufficiently achieved by the Member States and can therefore be better achieved at Community level, the Community may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty. In accordance with the principle of proportionality, as set out in that Article, this seventh Framework Programme does not go beyond what is necessary in order to achieve those objectives.

~~12 As already presented in the Commission Communications COM(2004) 101, 26.0.2004 and COM(2004) 487, 14.7.2004 on the Financial Perspectives 2007-2013.~~

(22) Implementation of the seventh Framework Programme may give rise to supplementary programmes involving the participation of certain Member States only, the participation of the Community in programmes undertaken by several Member States, or the setting up of joint undertakings or other arrangements within the meaning of Articles 168, 169 and 171 of the Treaty.

(23) The Community has concluded a number of international agreements in the field of research and efforts should be made to strengthen international research cooperation with a view to further integrating the Community into the world-wide research community.

(24) The seventh Framework Programme should contribute towards promoting sustainable development and environmental protection.

(25) Research activities supported by this Framework Programme should respect fundamental ethical principles, including those reflected in the Charter of Fundamental Rights of the European Union. The opinions of the European Group on Ethics in Science and New Technologies are and will be taken into account.

(26) Under the seventh Framework Programme due regard will be paid to the role of women in science and research with a view to further enhancing their active role in research.

(27) This act establishes a financial framework for the entire duration of the programme which is to be the principal point of reference for the budgetary authority, within the meaning of point […] of the Interinstitutional Agreement of […] between the European Parliament, the Council and the Commission on budgetary discipline and improvement of the budgetary procedure.

(28) Appropriate measures should also be taken to prevent irregularities and fraud and the necessary steps should be taken to recover funds lost, wrongly paid or incorrectly used in accordance with Council Regulations (EC, Euratom) No 2988/95 of 18 December 1995 on the protection of the European Communities financial interests[13], (EC, Euratom) No 2185/96 of 11 November 1996 concerning on-the-spot checks and inspections carried out by the Commission in order to protect the European Communities' financial interests against fraud and other irregularities[14] and Regulation (EC) No 1073/1999 of the European Parliament and of the Council concerning investigations conducted by the European Anti-Fraud Office (OLAF)[15].

(29) It is important to ensure sound financial management of the seventh framework programme and its implementation in the most effective and user-friendly manner possible, as well as ease of access for all participants. It is necessary to ensure compliance with Council Regulation (EC, EURATOM) No 1605/2002 of 25 June 2002 on the Financial Regulation applicable to the general budget of the European Communities; and with the requirements of simplification and better regulation.

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13 OJ L 312, 23.12.1995, p. 1.
14 OJ L 292, 15.11.1996, p. 2.
15 OJ L 136, 31.5.1999, p. 1.

HAVE DECIDED AS FOLLOWS:

Article 1

Establishment of the Framework Programme

The Framework Programme for Community activities in the area of research and technological development, including demonstration activities, hereinafter the "seventh Framework Programme" is hereby established for the period from 1 January 2007 to 31 December 2013.

Article 2

Objectives and activities

(1) The seventh Framework Programme shall support the activities set out in paragraphs 2 to 5. The objectives and the broad lines of those activities are set out in Annex I.

(2) Cooperation: supporting the whole range of research actions carried out in trans-national cooperation in the following thematic areas:

(a) Health;

(b) Food, Agriculture and Biotechnology;

(c) Information and Communication Technologies;

(d) Nanosciences, Nanotechnologies, Materials and new Production Technologies;

(e) Energy;

(f) Environment (including Climate Change);

(g) Transport (including Aeronautics);

(h) Socio-economic Sciences and Humanities;

(i) Security and Space.

(3) Ideas: supporting "investigator-driven" research carried out across all fields by individual teams in competition at the European level.

(4) People: strengthening, quantitatively and qualitatively, the human potential in research and technology in Europe.

(5) Capacities: supporting key aspects of European research and innovation capacities such as research infrastructures; regional research driven clusters; the development of a full research potential in the Community's convergence and outermost regions; research for the benefit of small and medium sized enterprises (SMEs); "Science in Society" issues; horizontal activities of international cooperation.

(6) The seventh Framework Programme shall also support the non-nuclear direct scientific and technical actions carried out by the Joint Research Centre (JRC) as defined in Annex I.

Article 3

The seventh Framework Programme shall be implemented through specific programmes. These programmes shall establish precise objectives and the detailed rules for implementation.

Article 4

Maximum overall amount and shares assigned to each programme

1. The maximum overall amount for Community financial participation in this seventh Framework Programme shall be EUR [ ] ~~72726~~ million. That amount shall be distributed among the activities and actions referred to in paragraphs 2 to 6 of Article 2 as follows (in EUR million):

Cooperation	[ ] ~~44432~~
Ideas	[ ] ~~11862~~
People	[ ] ~~7129~~
Capacities	[ ] ~~7486~~
Non-nuclear actions of the Joint Research Centre	[ ] ~~1817~~

2. The indicative breakdown among the thematic areas of each activity referred to in paragraph 1 is set out in Annex II.

3. The detailed rules for Community financial participation in this Framework Programme are set out in Annex III.

Article 5

Protection of the Communities' financial interests

For the Community actions financed under this Decision, Regulation (EC, Euratom) No 2988/95 and Regulation (EC, Euratom) No 2185/96 shall apply to any infringement of a provision of Community law, including infringements of a contractual obligation stipulated on the basis of the programme, resulting from an act or omission by an economic operator, which has, or would have, the effect of prejudicing the general budget of the European Communities or budgets managed by them, by an unjustified item of expenditure.

Article 6

All the research activities carried out under the seventh Framework Programme shall be carried out in compliance with fundamental ethical principles.

Article 7

Monitoring, assessment and review

1. Not later than 2010, the Commission shall carry out, with the assistance of external experts, an interim evaluation of this Framework Programme and its specific programmes on the quality of the research activities under way and progress towards the objectives set.

2. Two years following the completion of this Framework Programme, the Commission shall carry out an external evaluation by independent experts of its rationale, implementation and achievements.

   The Commission shall communicate the conclusions thereof, accompanied by its observations, to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.

Done at Brussels,

For the European Parliament	*For the Council*
The President	*The President*

ANNEX I : SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES, BROAD LINES OF THE THEMES AND ACTIVITIES

The seventh Framework Programme will be carried out to pursue the general objectives described in Article 163 of the Treaty in contributing towards the creation of a knowledge-based society, building on a European Research Area. It shall strengthen excellence in scientific and technological research through the following four programmes: cooperation, ideas, people and capacities.

I COOPERATION

In this part of the 7th Framework Programme, support will be provided to trans-national co-operation at every scale across the European Union and beyond, in a number of thematic areas corresponding to major fields of the progress of knowledge and technology, where research must be supported and strengthened to address European social, economic, environmental and industrial challenges.

The overarching aim is to contribute to sustainable development.

The nine themes determined for EU action are the following:

(1) Health;

(2) Food, Agriculture and Biotechnology;

(3) Information and Communication Technologies;

(4) Nanosciences, Nanotechnologies, Materials and new Production Technologies;

(5) Energy;

(6) Environment (including Climate Change);

(7) Transport (including Aeronautics);

(8) Socio-economic Sciences and the Humanities;

(9) Security and Space.

These themes are broadly defined at relatively high level, such that they can adapt to evolving needs and opportunities that may arise during the lifetime of the 7th Framework Programme. For each of them, a series of activities have been identified which indicate the broad lines envisaged for Community support. These have been identified on the basis of their contribution to EU objectives, including the transition to a knowledge society, the relevant European research potential and the added value of EU level intervention for these subjects.

Special attention will be paid to priority scientific areas which cut across themes, such as marine sciences and technologies.

Pluridisciplinarity will be encouraged by joint cross-thematic approaches to research and technology subjects relevant to more than one theme.

In the case of subjects of industrial relevance in particular, the topics have been identified relying, among other sources, on the work of different "European Technology Platforms" set up in fields where Europe's competitiveness, economic growth and welfare depend on important research and technological progress in the medium to long term. European Technology Platforms bring together stakeholders, under industrial leadership, to define and implement a Strategic Research Agenda. This Framework Programme will contribute to the realisation of these Strategic Research Agendas where these present true European added value.

The nine themes also include research needed to underpin the formulation, implementation and assessment of EU policies, such as in the areas of health, safety, consumer protection, energy, the environment, development aid, fisheries, maritime affairs, agriculture, animal welfare, transport, education and training, employment, social affairs, cohesion, and justice and home affairs, along with pre-normative and co-normative research relevant to improving the quality of standards and their implementation.

Under each theme, beside these activities, the possibility will be ensured to address two types of opportunities and needs in an open and flexible way:

- **Emerging needs:** through specific support for spontaneous research proposals aiming at identifying or further exploring, in a given field and/or at the intersection of several disciplines, new scientific and technological opportunities, in particular linked with a potential for significant breakthroughs;

- **Unforeseen policy needs:** to respond in a flexible way to new policy needs that arise during the course of the Framework Programme, such as unforeseen developments or events requiring a quick reaction like, the new epidemics, emerging concerns in food safety or natural disaster response.

In order to strengthen the diffusion and use of the output of EU research, the dissemination of knowledge and transfer of results, including to policy makers, will be supported in all thematic areas, including through the funding of networking initiatives, seminars and events, assistance by external experts and information and electronic services in particular CORDIS. Actions to support innovation will be taken under the Competitiveness and Innovation Programme. Support will also be provided to initiatives aiming at engaging the dialogue on scientific issues and research results with a broad public beyond the research community, and in the field of scientific communication and education. Ethical principles and gender aspects will be taken into account.

Across all these themes, support to trans-national cooperation will be implemented through:

- Collaborative research;

- Joint Technology Initiatives;

- Co-ordination of research programmes;

- International Co-operation.

Collaborative research

Collaborative research will constitute the bulk and the core of EU research funding. The objective is to establish, in the major fields of advancement of knowledge, excellent research projects and networks able to attract researchers and investments from Europe and the entire world.

This will be achieved by supporting collaborative research through a range of funding schemes: Collaborative projects, Networks of Excellence, Co-ordination/support actions (see Annex III).

Joint Technology Initiatives

In a limited number of cases, the scope of a RTD objective and the scale of the resources involved **could** justify setting up long term public private partnerships in the form of Joint Technology Initiatives. These initiatives, mainly resulting from the work of European Technology Platforms and covering one or a small number of selected aspects of research in their field, will combine private sector investment and national and European public funding, including grant funding from the Research Framework Programme and loan finance from the European Investment Bank. Joint Technology Initiatives may be decided on the basis of Article 171 of the Treaty (this may include the creation of a joint undertaking) or on the basis of the Specific Programme Decisions in accordance with Article 166 of the Treaty.

Potential Joint Technology Initiatives will be identified on the basis of a series of criteria including:

- Added value of European-level intervention.
- The degree and clarity of definition of the objective to be pursued.
- Strength of the financial and resource commitment from industry.
- Scale of the impact on industrial competitiveness and growth.
- Importance of the contribution to broader policy objectives.
- Capacity to attract additional national support and leverage current or future industry funding.
- Inability of existing instruments to achieve the objective.

Particular attention will be paid to the overall coherence and coordination between Joint Technology Initiatives and national programmes and projects in the same fields.

Co-ordination of non-Community research programmes

The action undertaken in this field will make use of two main tools: the ERA-NET scheme and the participation of the Community in jointly implemented national research programmes (Treaty Article 169). The action may cover subjects not directly linked to the nine themes in as far as they have a sufficient EU added value. The action will also be used to enhance the

complementar**it**y and synergy between the Framework Programme and activities carried out in the framework of intergovernmental structures such as EUREKA and COST[16].

The ERA-NET scheme will develop and strengthen the coordination of national and regional research activities by:

- Providing a framework for actors implementing public research programmes to step up the coordination of their activities. This will include support for new ERA-NETs as well as for the broadening and deepening of the scope of existing ERA-NETs, e.g. by extending their partnership, as well as opening mutually their programmes;

- **In a limited number of cases, p**~~P~~roviding additional EU financial support to those participants that create a common fund for the purpose of joint calls for proposals between their respective national and regional programmes ("ERA-NET PLUS").

The participation of the Community in national research programmes jointly implemented on the basis of Article 169 is especially relevant to European co-operation on a large scale in "variable geometry" between Member States sharing common needs and/or interests. Such Article 169 initiatives ~~will~~ **could** be launched in areas to be identified **that have the clear commitment of** ~~in close association with the~~ Member States **to pool resources**, including the possible cooperation with intergovernmental programmes, on the basis of a series of criteria:

- Relevance to EU objectives.

- The clear definition of the objective to be pursued and its relevance to the objectives of this Framework Programme.

- Presence of a pre-existing basis (national research programmes existing or envisaged).

- European added value.

- Critical mass, with regard to the size and the number of programmes involved, the similarity of activities they cover.

- Efficiency of Article 169 as the most appropriate means for achieving the objectives.

International co-operation

International cooperation actions under this part of the Framework Programme will be:

- The opening of all activities carried out in the thematic areas to researchers and research institutions from all third countries, with a strong effort to encourage them to seize this opportunity.

- Specific co-operation actions in each thematic area dedicated to third countries in the case of mutual interest in co-operating on particular topics. Closely associated

[16] This will include financial support for the administration and coordination activities of COST.

with the bilateral co-operation agreements or multilateral dialogues between the EU and these countries or groups of countries, these actions will serve as privileged tools for implementing the co-operation between the EU and these countries. Such actions are, in particular: actions aiming at reinforcing the research capacities of candidate countries as well as neighbourhood countries; cooperative activities targeted at developing and emerging countries, focusing on their particular needs in fields such as health, agriculture, fisheries and environment, and implemented in financial conditions adapted to their capacities.

This part of the Framework Programme covers the international co-operation actions in each thematic area and across themes. They will be implemented in coordination with those under the “People” and the “Capacities” part of the Framework Programme.

THEMES

1. Health

Objective

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

Rationale

The sequencing of the human genome and the recent advances in post-genomics have revolutionised research into human health and diseases. Integrating the vast amounts of data and understanding underlying biological processes requires bringing together critical masses of various expertises and resources that are not available at a national level. Significant advances in translational health research, which is essential to ensure that biomedical research provides practical benefits, also requires multidisciplinary and pan-European approaches involving different stakeholders. Such approaches allow Europe to contribute more effectively to international efforts to combat diseases of global importance.

Clinical research on many diseases (e.g. cancer, cardiovascular diseases, mental and neurological diseases, in particular those linked with ageing, such as Alzheimer and Parkinson diseases) relies on international multi-centre trials to achieve the required number of patients in a short time-frame. Epidemiological research requires a large diversity of populations and international networks to achieve significant conclusions. Developing new diagnostics and treatments for rare disorders also require multi-country approaches to increase the number of patients for each study. And performing health policy-driven research at the European level enables comparisons of the models, systems, data, and patient material held in national databases and biobanks.

A strong EU-based biomedical research will help strengthen the competitiveness of the European healthcare biotechnology, medical technology and pharmaceutical industries. The EU also has to play an active role in creating an environment conducive to innovation in the pharmaceutical sector, in particular to maximise the success of clinical research. Research-based SMEs are the main economic drivers of the healthcare biotechnology and medical technology industries. Although Europe now has more Biotechnology companies than US, most of them are small and less mature than their competitors. Public-private research efforts at the EU level will facilitate their development. EU research will also contribute to the development of new norms and standards to set up an appropriate legislative framework for new medical technologies (e.g. regenerative medicine).

The activities that will be addressed, which include research essential to policy requirements, are set out below. Two strategic issues, child health and the health of the ageing population will be addressed across activities. Research agendas established by European Technology Platforms, such as the one on innovative medicines, will be supported where relevant. To complement these and respond to new policy needs, additional actions may be supported ~~for example in the areas of health policy issues and occupational health and safety.~~

Activities

- **Biotechnology, generic tools and technologies for human health.**

– *High-throughput research*. To catalyse experimental progress in biomedical research by enhancing data generation, standardisation, acquisition and analysis.

– *Detection, diagnosis and monitoring.* With emphasis on non-invasive or minimally invasive approaches.

– *Innovative therapeutic approaches and intervention*. To consolidate and ensure further developments in advanced therapies and technologies with potential application in many diseases and disorders.

– *Predicting suitability, safety and efficacy of therapies.* To develop and validate biological markers, in vivo and in vitro methods and models, including ~~simulation, pharmacogenomics, targeting approaches and~~ alternatives to animal testing.

- **Translating research for human health**

– *Integrating biological data and processes: large-scale data gathering, systems biology.* To generate and analyse ~~the vast amount of~~ data needed to understand better the **function of** ~~complex regulatory networks of thousands of~~ genes and gene-products controlling important biological processes.

– *Research on the brain and related diseases, human development and ageing.* To explore the process of healthy ageing and the way genes and environment interact with brain activity, under normal conditions as well as in brain diseases.

– *Translational research in infectious diseases.* To address anti-microbial drug resistance, the global threats of HIV/AIDS, malaria and tuberculosis as well as emerging epidemics (e.g. SARS and highly pathogenic influenza).

– *Translational research in major diseases: cancer, cardiovascular disease, diabetes/obesity; rare diseases; and other chronic diseases (e.g. osteoarthritis).* To develop patient-oriented strategies from prevention to diagnosis and treatment including clinical research.

- **Optimising the delivery of health care to European citizens**

– **Enhanced health promotion and disease prevention. To develop efficient public health interventions addressing wider determinants of health, including mental health.**

– *Translating clinical* **research** *outcome into clinical practice.* To understand clinical decision-making ~~and how to translate outcomes of clinical research into~~ clinical practice**,** ~~and~~ especially addressing **patient safety and the better use of medicines (including some aspects of pharmacovigilence).** ~~the specificities of children, women and elderly population~~

– *Quality, efficiency, and solidarity of health systems.* **To provide a basis for countries to adapt their health systems in the light of emerging challenges and the experience of**

others. ~~including transitional health systems to translate effective interventions into management decisions, to ensure an adequate supply of human resources, to analyse factors influencing equity of access to high quality health care, including analyses of changes in population (e.g. ageing, mobility and migration, and the changing workplace).~~

~~– Enhanced disease prevention and better use of medicines. To develop efficient public health interventions addressing wider determinants of health (such as stress, diet or environmental factors). To identify successful interventions in different health care settings for improving the prescription of medicines and improving their use by patients (including pharmacovigilence aspects).~~

~~– Appropriate use of new health therapies and technologies. Long term safety aspects and monitoring of large scale use of new medical technologies (including devices) and advanced therapies ensuring a high level of protection for public health.~~

2. Food, Agriculture and Biotechnology

Objective

Building a European *Knowledge Based Bio-Economy*[17] by bringing together science, industry and other stakeholders, to exploit new and emerging research opportunities that address social and economic challenges: the growing demand for safer, healthier and higher quality food and for sustainable use and production of renewable bio-resources; the increasing risk of epizootic and zoonotic diseases and food related disorders; threats to the sustainability and security of agricultural and fisheries production resulting in particular from climate change; and the increasing demand for high quality food, taking into account animal welfare and rural contexts.

Rationale

Innovations and advancement of knowledge in the sustainable management, production and use of biological resources (micro-organism, plants, animals), will provide the basis for new, sustainable, eco-efficient and competitive products for agriculture, fisheries, food, health, forest based and related industries**.** In line with the European strategy on life sciences and biotechnology[18], this will help increase the competitiveness of European biotechnology and food companies, in particular high tech SMEs, while improving social welfare and well-being. Research into the safety of food and feed chains, diet related diseases, food choices and the impact of food and nutrition on health will help to fight food related disorders (e.g. obesity, allergies) and infectious diseases (e.g. transmissible spongiform encephalopathies, avian-flu), while making important contributions to the implementation of existing and the formulation of future policies and regulations in the area of public, animal and plant health and consumer protection.

The diversity of the European industries in these areas, while being one of its strengths and an opportunity, leads to fragmented approaches to similar problems. These are better addressed by increased collaboration and sharing of expertise, for example on new methodologies, processes and standards that result from changing EU legislation.

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17 The term "bio-economy" includes all industries and economic sectors that produce, manage and otherwise exploit biological resources and related services, supply or consumer industries, such as agriculture, food, fisheries, forestry, etc.

18 "Life Sciences and biotechnology – A strategy for Europe" - COM(2002) 27.

Several European Technology Platforms contribute in setting common research priorities, in fields such as plant genomics and biotechnology, forestry and forest based industries, global animal health, farm animal breeding, food and industrial biotechnology. The research will also provide the knowledge base needed to support[19]: the Common Agricultural Policy; agriculture and trade issues; food safety regulations; Community animal health, disease control and welfare standards; and the Common Fisheries Policy ~~reform~~ aiming to provide sustainable development of fishing and aquaculture. A flexible response to new policy needs is also foreseen, in particular with respect to new social or economic trends.

Activities

- **Sustainable production and management of biological resources from land, forest, and aquatic environments**: Enabling research, including ~~'omics' technologies, such as genomics, proteomics, metabolomics,~~ systems biology**, 'omics'** and converging technologies for micro-organisms, plants and animals, ~~including~~ **and** exploitation of ~~their~~ biodiversity; improved crops and production systems, including organic farming, quality production schemes and GMO impacts; sustainable, competitive and multifunctional agriculture, and forestry; rural development; animal welfare, breeding and production; plant health; sustainable and competitive fisheries and aquaculture; infectious diseases in animals, including zoonoses; safe disposal of animal waste; ~~conservation,~~ **sustainable** management and exploitation of living aquatic resources, developing the tools needed by policy makers and other actors in agriculture and rural development ~~(landscape, land management practices etc.)~~.

- **"Fork to farm": Food, health and well being**: Consumer, societal, industrial and health aspects of food and feed, including behavioural and cognitive sciences; **impact of** nutrition~~,~~ **and** diet **on health,**~~related~~ diseases and disorders~~, including obesity~~; innovative food and feed processing technologies (including packaging); improved quality and safety, both chemical and microbiological, of food, beverage and feed; integrity (and control) of the food chain; environmental impacts on and of food/feed chains; total food chain concept (including seafood); traceability.

- **Life sciences and biotechnology for sustainable non-food products and processes**: Improved crops, feed-stocks, marine products and biomass (including marine resources) for energy **production**, ~~environment,~~ and high added value products such as materials and chemicals, including novel farming systems, ~~bio-processes and~~ bio-refinery concepts **and clean bioprocesses, including**~~;~~ bio-catalysis **and bioremediation**; forestry and forest based products and processes~~; environmental remediation and cleaner processing~~.

3. Information and Communication Technologies

Objective

To enable Europe to master and shape the future developments of Information and Communication Technologies (ICT) so that the demands of its society and economy are met. Activities will strengthen Europe's scientific and technology base in ICT, help drive and stimulate innovation through ICT use and ensure that ICT progress is rapidly transformed into benefits for Europe's citizens, businesses, industry and governments.

[19] Complementary research relating to the sustainable management and conservation of natural resources is addressed under the "Environment (including Climate Change)" theme.

Rationale

Information and Communication Technologies are critical to Europe's future and underpin the realisation of the Lisbon agenda. Half of the productivity gains in our economies are explained by the impact of ICT on products, services and business processes. ICT is the leading factor in boosting innovation and creativity and in mastering change in value chains across industry and service sectors. ICT is essential to meet the rise in demand for health and social care and to modernise services in domains of public interest such as education, learning, security, energy, transport and the environment. And ICT is catalytic in the advance of other fields of science and technology as it transforms the way researchers conduct their research, co-operate and innovate.

The escalating economic and societal demands, together with the continued mainstreaming of ICT and the need to push further the technology limits set a growing agenda for research. To bring technology closer to people and organisational needs means: hiding technology complexity and revealing functionality on demand; making technology very simple to use, available and affordable; providing new ICT-based applications, solutions and services that are trusted, reliable, and adaptable to the users' context and preferences. Driven by the demand of more-for-less, ICT researchers are involved in a global race to achieve further miniaturisation, to master the convergence of computing, communications and media technologies, and the convergence with other relevant sciences and disciplines, and to build systems that are able to learn and evolve. From these diverse efforts a new wave of technologies is emerging. ICT research activities will also draw on a broader range of scientific and technological disciplines including bio- and life sciences, psychology, pedagogy, cognitive and social sciences.

ICT is one the most research intensive sectors. The ICT research effort, public and private, represents a third of the total research effort in all major economies. Although Europe already enjoys industrial and technological leadership in key ICT fields it lags in investing in ICT research behind its major competitors. Only through a renewed and more intensive pooling of the effort at European level will we be able to make the most of the opportunities that progress in ICT can offer.

The ICT research activities will be closely articulated with policy actions for ICT deployment and with regulatory measures within a comprehensive and holistic strategy. Priorities have been set following extensive consultations including input from a series of European Technology Platforms and industrial initiatives in areas such as nano-electronics, embedded systems, mobile communications, electronic media, robotics and software, services and Grids.

Activities

- **ICT Technology Pillars**:

– *Nano-electronics, photonics and integrated micro/nano-systems*. pushing the limits of miniaturisation, integration, variety and density; increasing performance and manufacturability at lower cost; facilitating incorporation of ICT in range of applications; interfaces; upstream research requiring exploration of new concepts.

– *Ubiquitous and unlimited capacity communication networks*: ubiquitous access over heterogeneous networks - fixed, mobile, wireless and broadcasting networks spanning from the personal area to the regional and global area - allowing the seamless delivery of ever higher volumes of data and services anywhere, anytime.

– *Embedded systems, computing and control*: powerful, secure and distributed computing and communication systems that are embedded in objects and physical infrastructures and that can control and adapt to their environment.

– *Software, Grids, security and dependability*: dynamic, adaptive, dependable and trusted software and services, and new processing architectures, including their provision as a utility.

– *Knowledge, cognitive and learning systems*: capturing and exploiting knowledge embedded in web and multimedia content; bio-inspired artificial systems that perceive, understand, learn and evolve, and act autonomously; learning by machines and humans based on a better understanding of human cognition.

– *Simulation, visualisation, interaction and mixed realities*: tools for innovative design and creativity in products, services and digital media, and for natural, language-enabled and context-rich interaction and communication.

New perspectives in ICT drawing on other science and technology disciplines, including insights from physics, biotechnologies, materials- and life-sciences, for miniaturisation of ICT devices to sizes compatible and interacting with living organisms, to increase performance of systems engineering and information processing, and for modelling and simulation of the living world.

- **Integration of Technologies**:

– *Personal environments*: personal communication and computing devices, accessories, wearables, implants; their interfaces and interconnections to services and resources.

– *Home environments*: communication, monitoring, control, assistance; seamless interoperability and use of all devices; interactive digital content and services.

– *Robotic systems*: advanced autonomous systems; cognition, control, action skills, natural interaction; miniaturisation.

– *Intelligent infrastructures*: tools making infrastructures that are critical to everyday life more efficient, easier to adapt and maintain, more robust to usage and resistant to failures.

- **Applications Research:**

– *ICT meeting societal challenges*: New systems and services in areas of public interest improving quality, efficiency, access and inclusiveness; user friendly applications, integration of new technologies and initiatives such as ambient assisted living.

  – for *health*, improving disease prevention, early diagnosis and personalisation; autonomy, safety and mobility of patients; health information space for knowledge discovery.

  – to improve *inclusion* and equal participation and prevent digital divides; assistive technology; design-for-all.

  – for *mobility*; intelligent ICT-based transportation systems and vehicles enabling people and goods to move safely, comfortably and efficiently.

– in support of *the environment* and sustainable development, to reduce vulnerability and to mitigate the consequences of natural disasters and industrial accidents.

– for *governments*; efficiency, openness and accountability, for a world-class public administration and links to citizens and businesses, supporting democracy.

– *ICT for content, creativity and personal development:*

– new *media* paradigms and new forms of content; creation of interactive digital content; enriched user experiences; cost-effective content delivery.

– technology-enhanced *learning*; adaptive and contextualised learning solutions; active learning.

– ICT-based systems to support accessibility and use over time of digital *cultural* resources and assets, in a multilingual environment

– *ICT supporting businesses and industry:*

– new forms of dynamic networked co-operative *business* processes, digital eco-systems; optimised *work* organisation and collaborative work environments.

– *Manufacturing:* rapid and adaptive design, production and delivery of highly customised goods; digital and virtual production; modelling, simulation and presentation tools; miniature and integrated ICT products;

– *ICT for trust and confidence*: identity management; authentication and authorization; privacy enhancing technologies; rights and asset management; protection against cyber threats.

- **Future and Emerging Technologies:** to support research at the frontier of knowledge in core ICTs and in their combination with other relevant areas and disciplines; to nurture novel ideas and radically new uses and to explore new options in ICT research roadmaps.

4. Nanosciences, Nanotechnologies, Materials and new Production Technologies

Objective

Improve the competitiveness of European industry and ensure its transformation from a resource-intensive to a knowledge-intensive industry, by generating ~~breakthrough~~ **step changes in knowledge for new applications at the crossroads between different technologies and disciplines.**

Rationale

The decline in industrial activities appears no longer to be limited to traditional sectors with a high labour intensity, but is beginning to be observed in intermediate sectors – which constitute the established strengths of European industry – and even in some high-technology

sectors. This trend can and must be reversed by building, in Europe, a strong knowledge-based, knowledge intensive industry. This will include the modernisation of the existing SME base and the creation of new knowledge-driven SMEs, from the dissemination of knowledge and expertise through collaborative programmes.

The EU has recognised leadership in fields such as in nanotechnologies, materials and production technologies which must be strengthened in order to secure and increase the EU position in a highly competitive global context.

European Technology Platforms ~~in fields such as nanoelectronics, manufacturing, steel, chemistry, the transport industry, construction, industrial safety, textiles, pulp and paper~~ help establish common research priorities and targets. In addition to industry relevant priorities and their integration for sectoral applications,~~,~~ the relevant policy, ~~regulatory and standardisation,~~ and impact issues will be addressed, including by responding flexibly to new policy needs that arise.

Activities

- **Nanosciences, nanotechnologies**

– Generating new knowledge on interface and size dependent phenomena; nano-scale control of material properties for new applications; integration of technologies at the nano-scale; **self assembly**~~self-assembling properties~~; nano-motors; ~~nano-~~machines and ~~nano-~~systems; methods and tools for characterisation and manipulation at nano dimensions; nano~~- and high-~~precision technologies in chemistry; impact on human safety, health and the environment; metrology, nomenclature and standards; exploration of new concepts and approaches for sectoral applications, including the integration and convergence of emerging technologies.

- **Materials**

– Generating new knowledge on high-performance materials for new products and processes; knowledge-based materials with tailored properties; more reliable design and simulation; higher complexity; environmental compatibility; integration of nano-molecular-macro levels in the chemical technology and materials processing industries; new nano-materials, bio-materials and hybrid materials, including design and control of their processing.

- **New Production**

– Creating conditions and assets for knowledge-intensive production, including construction, development and validation of new paradigms responding to emerging industrial needs; development of generic production assets for adaptive, networked and knowledge-based production; development of new engineering concepts exploiting the convergence of technologies ~~(eg, nano, bio, info, cognitive and their engineering requirements)~~ for the next generation of high value-added products and services~~, and adaptation to the changing needs~~.

- **Integration of technologies for industrial applications**

– Integrating new knowledge and technologies on nano, materials and production in sectoral and cross sectoral applications **to address in particular the needs identified by**

concerned European Technology Platforms. ~~such as: health, construction, transport, energy, chemistry, environment, textiles and clothing, pulp and paper, mechanical engineering~~.

5. Energy

Objective

Transforming the current fossil-fuel based energy system into a more sustainable one based on a diverse portfolio of energy sources and carriers combined with enhanced energy efficiency, to address the pressing challenges of security of supply and climate change, whilst increasing the competitiveness of Europe's energy industries.

Rationale

Energy systems are confronted with major challenges. The urgency to develop adequate and timely solutions is justified by the alarming trends in global energy demand (predicted to rise by 60% in the next 30 years), the need to curb dramatically emissions of greenhouse gases to mitigate the devastating consequences of climate change, the damaging volatility of oil prices (in particular for the transport sector which is heavily oil dependent) and geopolitical instability in supplier regions. Research and demonstration are needed to provide the most environmentally and cost-effective technologies and measures enabling the EU to meet its targets under the Kyoto Protocol and beyond and to implement its energy policy commitments, as described in the 2000 Green Paper on the security of energy supply[20] **and the 2006 Green Paper on a European strategy for sustainable competitive and secure energy**[21].

Europe has developed world leadership in a number of energy technologies. It is the pioneer in modern renewable energy technologies, such as bio-energy and wind energy. The EU is also a global competitor in power generation and distribution technologies and has a strong research capability in the area of carbon capture and sequestration. These positions, however, are under severe threat from competition (in particular from the US and Japan).

Radically transforming the energy system requires new technologies with risks that are too high and the benefits too uncertain for private firms to provide all the investment needed for research, development, demonstration and deployment. Public support should therefore play a key role in mobilising private investment and European efforts and resources should be combined in a coherent and more effective manner, to compete with economies that are investing heavily and consistently in similar technologies. European technology platforms play a vital role in this regard, by mobilising the necessary research effort in a coordinated manner. The activities to meet the objective are set out below**, with a focus on technologies where sufficient economic and technical potential exists**. A specific activity on knowledge for energy policy making is included which may also provide support to new policy needs that emerge, for example relating to the role of European energy policy in the developments of international climate change actions, and instabilities or disruptions in energy supply and price.

[20] COM(2000) 769.
[21] COM(2006) 105

Activities

- **Hydrogen and fuel cells**

Integrated action to provide a strong technological foundation for competitive EU fuel cell and hydrogen industries, for stationary, portable and transport applications. The Hydrogen and Fuel Cells European Technology Platform helps this activity by proposing an integrated research and deployment strategy.

- **Renewable electricity generation**

Technologies to increase overall conversion efficiency, driving down the cost of electricity production from indigenous renewable energy sources, and the development and the demonstration of technologies suited to different regional conditions.

- **Renewable fuel production**

Integrated conversion technologies: to develop and drive down the unit cost of solid, liquid and gaseous (including hydrogen) fuels produced from renewable energy sources, aiming at the cost-effective production and use of carbon-neutral fuels, in particular liquid biofuels for transport.

- **Renewables for heating and cooling**

Technologies to increase efficiencies and drive down the costs of heating and cooling from renewable energy sources, ensuring their use in different regional conditions.

- **CO2 capture and storage technologies for zero emission power generation**

To drastically reduce the environmental impact of fossil fuel use aiming at highly efficient power generation plants with near zero emissions, based on CO2 capture and storage technologies.

- **Clean coal technologies**

To substantially improve plant efficiency, reliability and cost through development and demonstration of clean coal conversion technologies.

- **Smart energy networks**

To increase the efficiency, safety and reliability of the European electricity and gas systems and networks e.g. by transforming the current electricity grids into an interactive (customers/operators) service network and to remove obstacles to the large-scale deployment and effective integration of distributed and renewable energy sources.

- **Energy efficiency and savings**

New concepts**,** ~~, and~~ technologies **and integrated strategies** to improve energy efficiency and savings for buildings, services and industry~~. This includes the integration of strategies and technologies for energy efficiency, the use of new and~~ **, including the use of** renewable energy technologies and energy demand management.

- **Knowledge for energy policy making**

Development of tools, methods and models to assess the main economic and social issues related to energy technologies ~~and to provide quantifiable targets and scenarios for medium and long term horizons~~.

6. Environment (including Climate Change)

Objective

Sustainable management of the environment and its resources through advancing our knowledge on the interactions between the biosphere, ecosystems and human activities, and developing new technologies, tools and services, in order to address in an integrated way global environmental issues. Emphasis will be put on prediction of climate, ecological, earth and ocean systems changes; on tools and technologies for monitoring, prevention and mitigation of environmental pressures and risks including on health, as well as for the conservation of the natural and man-made environment.

Rationale

Environmental problems go beyond national frontiers and require a coordinated approach at a pan-European and often global level. Earth's natural resources and the man-made environment are under intense pressures from growing population, urbanisation, continuous expansion of the agriculture, transport and energy sectors, as well as climate variability and warming at local, regional and global scales. Europe needs to engage in a new sustainable relationship with the environment while improving competitiveness and strengthening European industry. EU-wide cooperation is needed to attain critical mass given the scale, scope and high level of complexity of environmental research. It facilitates common planning, the use of connected and inter-operable **information systems and** databases, and the development of coherent and large scale observation and forecasting systems.

Research is needed at EU level for the implementation of international commitments such as the Kyoto protocol, the UN Convention on Biological Diversity, the objectives of the World Summit on Sustainable Development 2002, including the EU Water Initiative, and contributions to the Intergovernmental Panel on Climate Change and the Earth Observation initiative. In addition there are significant research needs arising from existing and emerging EU level policies, the implementation of the 6th Environmental Action Plan and associated thematic strategies, the action plans on Environmental Technologies and Environment and Health, and Directives such as the Water Framework.

The EU needs to strengthen its position in world markets for environmental technologies. Such technologies help deliver sustainable growth providing eco-efficient solutions to environmental problems at different scales and protecting our cultural heritage. Environmental requirements act as a stimulus for innovation and can provide business opportunities. European Technology Platforms on water supply and sanitation and on sustainable chemistry confirm the need for EU level action and their research agendas are taken into consideration in the activities below. Other Platforms (e.g. on Construction and on Forestry) partially deal with environmental technology issues and are taken into consideration as well.

A series of activities are listed below[22] many of which are directly relevant to policy needs. However, additional support may be provided to new policy needs that emerge, for example relating to sustainability impact assessments of EU policies; the follow up of the post-Kyoto action on Climate Change; and new environmental policies such as in maritime policy, standards and regulations.

Activities

- **Climate change, pollution and risks**

– *Pressures on environment and climate:* Functioning of climate and the earth system; adaptation and mitigation measures; ~~pollution in air, soil and water~~**emissions from anthropogenic and natural sources**; changes in atmospheric composition and water cycle; interactions between climate, land surface**,** ~~and the~~ ocean **and ecosystems**; and **climate change** impacts ~~on biodiversity and ecosystems~~.

– *Environment and health:* Interaction of environmental stressors with human health including identification of sources, links to indoor environment, and impact and emerging risk factors; integrated risk assessment methods for toxic substances ~~including alternatives to animal testing~~; quantification and cost-benefit analysis of environmental health risks and indicators for prevention strategies.

– *Natural hazards:* Improve prediction and integrated hazards- vulnerability - and risks assessments for disasters related to geological hazards (such as earthquakes, volcanoes, tsunamis) and climate (such as storms and floods); **underpin the** develop**ment of** early warning systems and improve ~~prevention~~ **management** and mitigation strategies.

- **Sustainable Management of Resources**

– *Conservation and sustainable management of natural and man-made resources*: ecosystems~~;~~ **and** water resources management; ~~waste management and prevention;~~ protection and management of biodiversity, soil protection, seabed and coastal areas protection, approaches against desertification and land degradation; forest management; sustainable management and planning of urban environment~~, data management and information services; assessment and foresight relating to natural processes~~.

– *Evolution of marine environments*: Impacts of human activities on the marine environment and its resources; pollution and eutrophication in regional seas and coastal areas; deep sea ecosystems; assessment of marine biodiversity trends, of ecosystem processes and of ocean circulation; seabed geology.

- **Environmental Technologies**

– *Environmental technologies for* ***the sustainable management and conservation of the natural and man-made environment:*** ~~observation,~~ **monitoring**, prevention, mitigation, ~~adaptation,~~ remediation and restoration ~~*of the natural and man-made environment:*~~ related to water, ~~climate,~~ air, marine, urban and rural environment, soil, waste treatment, recycling, clean production processes, ~~chemicals safety,~~ protection of cultural heritage and of the built environment.

[22] Complementary research relating to the production and use of biological resources is addressed under the "Food, Agriculture and Biotechnology" theme.

– *Technology assessment, verification and testing*: Methods and tools for environmental risk and lifecycle assessment of processes, technologies and products; support for sustainable chemistry, water supply and sanitation Platforms[23]; scientific and technological aspects of a future European environmental technologies verification and testing programme.

- **Earth observation and assessment tools**

– *Earth observation:* Contribute to the development and integration of observation systems for environmental and sustainability issues in the framework of GEOSS; interoperability between systems and optimisation of information for understanding, modelling and predicating environmental phenomena.

– ~~Forecasting methods and a~~***A****ssessment tools* ***for sustainable development****:* modelling links between economy/environment/society including market based instruments, externalities, thresholds and developing the knowledge base and methodologies for sustainability impact assessment ~~with emphasis on key issues such as land use and marine issues; social and economic tensions related to climate change~~.

7. Transport (including Aeronautics)

Objective

Based on technological advances, develop integrated, "greener" and "smarter" pan-European transport systems for the benefit of the citizen and society, respecting the environment and natural resources; and securing and further developing the leading role attained by the European industries in the global market.

Rationale

Transport is one of Europe's strengths - the air transport sector contributes to 2.6% of the EU GDP (with 3.1 million jobs) and the surface transport field generates 11% of the EU GDP (employing some 16 million persons). However, transport is responsible for 25% of all the EU emissions of CO_2, hence the absolute need for a "greening" of the system to ensure more sustainable transport patterns and compatibility with growth rates, as developed in the White Paper on "European Transport Policy for 2010: time to decide".[24]

The enlargement (increasing land surface by 25% and population by 20%) and economic development of the EU present new challenges for transporting people and goods efficiently, cost-effectively and in a sustainable manner. Transport also has direct relevance on other major policies such as trade, competition, employment, cohesion, energy, security and the internal market. Investment in RTD in EU transport industries is a prerequisite to ensure technological competitive advantage in global markets.[25] Activities at European level will also stimulate the restructuring of the industry, including the integration of the supply chain and in particular SMEs.

[23] The research agendas of these European Technology Platforms will be taken into account in the different activities.

[24] COM(2001) 370.

[25] The European aeronautics industry invests 14% of its turnover in research, the European car industry almost 5% of its turnover; and the EU shipbuilding industry competitive advantage relies exclusively on RTD.

The research agendas developed by European Technology platforms[26] support the need to take a new "transport systems" perspective that considers the interactions of vehicles, transport networks and the use of transport services, which can only be developed at European level. RTD costs in all these fields are rising substantially, and collaborative activity at EU-level is essential to enable a "critical mass" of diverse RTD providers to address the scale and multi-disciplinary challenges in a cost-effective way, as well as meeting the political, technological and socio-economic challenges on issues such as the "clean and safe vehicle" of the future, interoperability and intermodality with particular reference to rail transport, affordability, safety, capacity, security and environmental impacts in an enlarged Union. Also, developing technologies in support of the Galileo system and its applications will be essential in implementing European policies.

As well as the strong industry relevance of the themes and activities set out below, the needs of policy makers will be addressed in an integrated way covering economic, social and environmental aspects of transport policy. In addition, support will be provided to respond to existing as well as new policy needs, for example relating to developments in maritime policy.

Activities

- **Aeronautics and air transport**

– *The greening of air transport:* reduction of emissions and noise disturbance, incorporating work on engines and alternative fuels, structures and new aircraft designs, airport operations and traffic management.

– *Increasing time efficiency:* improvement of the efficiency of operating schedules focusing on innovative air traffic management systems in line with the effective implementation of Single Sky policy which integrate air, ground and space components, including traffic flow and more aircraft autonomy.

– *Ensuring customer satisfaction and safety:* improvement of passenger comfort, innovative in-flight services and more efficient passenger handling; improvement of all safety aspects of air transport; wider choice of aircraft ~~ranging from wide body to small size vehicles~~.

– *Improving cost efficiency:* reduction of costs associated with product development, manufacturing and operating costs focusing on zero maintenance aircraft, increased use of automation and simulation.

– *Protection of aircraft and passengers:* enhancement of protection measures for the traveller, crew, aircraft and air transport system ~~such as improved data and identification methods, protecting the aircraft against attack, auto recovery~~ ~~and~~ **as well as** improved security design of aircraft.

– *Pioneering the air transport of the future:* addressing the longer term challenges of aviation with more radical, environmentally efficient and innovative combinations of technologies ~~which wcould~~ lead**ing** to significant steps forward in air transport.

[26] ACARE: Advisory Council for Aeronautics Research in Europe. Launched in 2001, it is the first operational example of a Technology Platform; ERRAC: European Rail Research Advisory Council; ERTRAC: European Road Transport Research Advisory Council; WATERBORNE Technology Platform.

- **Surface transport (rail, road and waterborne**)

– *The greening of surface transport*: reduction of environmental and noise pollution;; development of clean and efficient engines, including hybrid technology and the use of alternative fuels for transport applications; end of life strategies for vehicles and vessels.

– *Encouraging modal shift and decongesting transport corridors:* development of innovative, intermodal and interoperable ~~regional and national~~ transport networks, infrastructures and systems in Europe; cost internalisation; ~~information exchange between vehicle/vessel and transport infrastructure;~~ optimisation of infrastructure capacity **and its use**.

– *Ensuring sustainable urban mobility:* innovative organisation schemes, including clean and safe vehicles and non-polluting means of transport, new public transportation modes and rationalisation of private transport, communication infrastructure~~, integrated town planning and transport.~~

– *Improving safety and security*: as inherent to the transport system, in transport operations**,** for **transport users,** ~~drivers, passengers, crew, cyclists and pedestrians,~~ **and** in the design of vehicles~~,~~ **and** vessels~~, and within the total transport system~~.

– *Strengthening competitiveness*: improvement of design processes~~; development of advanced power-train~~ and vehicle technologies; innovative and cost-effective production systems and infrastructure construction~~; integrative architectures~~.

- **Support to the European global satellite navigation system (Galileo):** precise navigation and timing services for use in a range of sectors; efficient use of satellite navigation and support to the definition of second generation technologies.

8. Socio-Economic Sciences and the Humanities

Objective

Generating an in-depth, shared understanding of complex and interrelated socio-economic challenges Europe is confronted with, such as growth, employment and competitiveness, social cohesion and sustainability, quality of life and global interdependence, in particular with the view of providing an improved knowledge base for policies in the fields concerned.

Rationale

Europe has a strong and high quality research base in socio-economic sciences and the humanities fields. The diversity of approaches within the EU in the economic, social, political and cultural domains provides a highly fertile ground for research in these fields at EU-level. There is a high European added value in collaborative research addressing European socio-economic issues in the areas mentioned. First, the issues and challenges concerned are of high priority at the EU level and are addressed by EU policies. Second, comparative research across several or all EU countries offers a particularly effective tool as well as important learning opportunities across countries and regions.

Third, EU-level research has particular advantages in being able to develop Europe-wide data collection and to employ the multiple perspectives needed to understand complex issues.

Finally, the development of a genuinely European socio-economic knowledge base on these key challenges will make an essential contribution to promoting their shared understanding across the European Union and, most significantly, on the part of the European citizens.

The activities to be supported are listed below and are expected to contribute significantly to improve the formulation, implementation, impacts and assessments of policy in a wide range of areas such as economic, social, education and training, enterprise, international trade, consumer, external relations, justice and home affairs and official statistics policies. In addition, opportunities will be provided to address emerging socio-economic challenges as well as to undertake research on new or unforeseen policy needs.

Activities

- **Growth, employment and competitiveness in a knowledge society:** developing and integrating research on the issues affecting **these** ~~growth, employment and competitiveness~~, ranging from innovation, education including life-long learning and the role of ~~scientific and other~~ knowledge, to national institutional contexts.

- **Combining economic, social and environmental objectives in a European perspective:** by addressing the ~~two key and highly interrelated issues of continuing~~ evolution of European socio-economic models and economic and social cohesion in an enlarged EU, taking into account the protection of the environment.

- **Major trends in society and their implications:** such as demographic change including ageing and migration; lifestyles, work, **and** families, ~~,~~ **including** gender issues~~, health~~ and quality of life; criminality; the role of business in society**;** and population diversity, cultural interactions**,** ~~and issues related to protection of~~ fundamental rights and ~~the fight against~~ racism ~~and intolerance~~.

- **Europe in the world:** understanding changing interactions and interdependencies between world regions and their implications for the regions concerned, especially Europe; and addressing emerging threats ~~and risks~~ without undermining human rights~~,~~ **and** freedom**s** ~~and well-being~~.

- **The citizen in the European Union:** in the context of the future development of the EU, ~~addressing the issues of achieving a sense of~~ democratic "ownership" and active participation by the peoples of Europe; effective and democratic governance ~~including economic governance~~; and building a shared understanding and respect for Europe's diversities and commonalities in terms of culture, institutions, history~~,~~ **and** languages ~~and values~~.

- **Socio-economic and scientific indicators:** their use in policy ~~and its implementation and monitoring~~, the improvement of existing indicators and the development of new ones for this purpose and for the evaluation of research programmes, including indicators based on official statistics.

- **Foresight activities: focusing** on major science, technology and related socio-economic issues such as the ~~future demographic trends and the globalization of knowledge and~~ evolution of research systems, as well as of the future developments in and across major research domains and scientific disciplines.

9. Security and Space

Objective

To develop the technologies and knowledge for building capabilities needed to ensure the security of citizens from threats such as terrorism, and crime, while respecting fundamental human rights; to ensure optimal and concerted use of available technologies to the benefit of European security, and to stimulate the co-operation of providers and users for security solutions.

Supporting a European Space Programme focusing on applications such as GMES (Global Monitoring for Environment and Security) with benefits for citizens and for the competitiveness of the European space industry. This will contribute to the development of a European Space Policy, complementing efforts by Member States and by other key players, including the European Space Agency.

9.1 Security

Rationale

Security in Europe is a precondition of prosperity and freedom. The EU Security Strategy: 'A Secure Europe in better World', adopted by the European Council, addresses the need for a comprehensive security strategy encompassing both civil and defence-related security measures.

Security related research is an important building block in supporting the Common Foreign and Security Policy as well as for realising a high level of security within an EU-wide area of justice, freedom and security[27] as underpinned by the Hague programme. It will also contribute to developing technologies and capabilities in support of other EU policies in areas such as transport, civil protection, energy and environment.

Existing security related research activities in Europe suffer from the fragmentation of efforts, the lack of critical mass of scale and scope and the lack of connections and interoperability. Europe needs to improve the coherence of its efforts by developing efficient institutional arrangements and by instigating the various national and international actors to co-operate and co-ordinate in order to avoid duplication and to explore synergies wherever possible. Security research at Community level will focus on activities of **a transnational character with** clear added value to the national level. As a consequence, security research at Community level will reinforce the competitiveness of the European security industry.

The activities set out below will complement and integrate the technology- and systems-oriented research relevant to security which is carried out in other themes. They will be mission-oriented, developing the technologies and capabilities as required by the specific security missions. They are by design flexible so as to accommodate as yet unknown future security threats and related policy needs that may arise, stimulating cross-fertilisation and the take-up of existing technologies for the civil security sector, European security research will also encourage the development of multi-purpose technologies in order to maximise the scope for their application.

[27] Prevention, Preparedness, and response to terrorist attacks - COM(2004) 698, 700, 701, 702; Solidarity/ CBRN programme.

Activities

- **Protection against terrorism and crime:** delivering technology solutions for threat (e.g. CBRN) awareness, detection, prevention, identification, protection, neutralisation and containment of effects of terrorist attacks and crime.

- **Security of infrastructures and utilities:** analysing and securing existing and future public and private critical/networked infrastructure (e.g. in transport, energy, ICT), systems and services (including financial and administrative services).

- **Border security:** focusing on technologies and capabilities to enhance the effectiveness and efficiency of all systems, equipment, tools and processes required for improving the security of Europe's land and coastal borders, including border control and surveillance issues.

- **Restoring security in case of crisis:** focusing on technologies in support of diverse emergency management operations (such as civil protection, humanitarian and rescue tasks, support to CFSP), and on issues such as inter-organisational co-ordination and communication, distributed architectures and human factors.

Within these four activities research related to the integration of security systems and interoperability will be covered. It will focus on different technologies to enhance interoperability, including law enforcement information infrastructures as well as the reliability and integrity of information and traceability of transactions and processing.
The above four areas will be supported by the following themes of a more cross-cutting nature:

- ~~Security Systems Integration and interoperability: focusing on technologies to enhance the interoperability of systems, equipment, services and processes, including law enforcement information infrastructures, as well as on the reliability, organisational aspects, protection of confidentiality and integrity of information and traceability of all transactions and processing.~~

- **Security and society:** mission orientated research which will focus onsocio-economic analyses, scenario building and activities related to: crime, the citizen's perception of security, ethics, protection of privacy and societal foresight. Research will also address technologies that better safeguard privacy and liberties, and will address vulnerabilities and new threats, as well as the management and impact assessment of possible consequences.

- **Security Research Co-ordination and structuring:** co-ordination of European and international security research efforts and development of synergies between civil, security and defence research, improvement of legal conditions, and encouragement to the optimal use of existing infrastructures.

9.2 Space

Rationale

The ~~EU~~**Community**can contribute in this field to the better definition of common objectives based on user requirements and policy objectives; to the coordination of activities, to avoid duplications and maximise interoperability; and to the definition of standards. Public authorities and decision-makers represent important potential users.~~ and the European industry will also benefit from a well defined European Space policy implemented through a European Space Programme, supported in part by the proposed research and technological development actions.~~ European level actions are also needed to support EU policy objectives, for example in the fields of agriculture, fisheries, environment, telecommunications, security, transport as well as ensuring that Europe is a respected partner in regional and international cooperation.

In the last 40 years, Europe has built up excellent technological competence. Sustaining a competitive industry (including manufacturers, service providers and operators) **and providing appropriate services and infrastructures** requires new research ~~and~~**into new** technologies **and their exploitation**. ~~Space applications bring important benefits to the citizens.~~

The activities set out below aim at: the **efficient** exploitation of space assets for the implementation of applications, ~~namely~~ **in particular** GMES (Global Monitoring for Environment and Security) and their contribution to law enforcement in EU policies~~; as well as space exploration, allowing international cooperation opportunities and dramatic technological breakthroughs;. exploitation and exploration of space supported through~~ **and support to** enabling activities guaranteeing the strategic role of the European Union **in the space sector and allowing international cooperation opportunities and technological breakthroughs**. These activities will be complemented by other actions included in the Competitiveness and Innovation Framework Programme and in the Education and Training Programme~~. The public policy benefits of the below activities will also be maximised, included a~~**A**dditional support for **could be foreseen** new policy needs that may arise, for example: space based solutions in support of developing countries; and use of space-observation tools and methods to support developments in Community policies.

Activities

- **Space-based applications at the service of the European Society**

– GMES: development of satellite-based monitoring **and early-warning** systems and techniques relating to the management of the environment and security and their integration with ground-based, ship-borne and airborne components; support to the use and delivery of GMES data and services**; and integration with satellite communication and satellite navigation solutions.**

~~– Innovative satellite communication services, seamlessly integrated in the global electronic communication networks, for citizens and enterprises in application sectors encompassing civil protection, e-government, telemedicine, tele-education and generic users.~~

~~– Development of technologies for reducing the vulnerability of space-based services and for contributing to the surveillance of space.~~

~~• Exploration of space~~

~~— Contribution to international space exploration initiatives.~~

- **RTD for strengthening space foundations**

Providing R&D support and maximising scientific added value through synergies with initiatives of the European Space Agency (ESA) or other European, national or regional entities in:

– Space **technologies: future space** transportation, technology~~: research~~ to increase the competitiveness of the European space transportation sector.**; technologies for the security of space based systems.**

– Space sciences including life in space**; space exploration; surveillance of space; facilitating access to scientific data and its dissemination.**

II IDEAS

Objective

This programme will enhance the dynamism, creativity and excellence of European research at the frontier of knowledge. This will be done by supporting "investigator-driven" research projects carried out across all fields by individual teams in competition at the European level. Projects will be funded on the basis of proposals presented by researchers on subjects of their choice and evaluated on the sole criterion of excellence as judged by peer review.

Rationale

Investigator-driven "frontier" research is a key driver of wealth and social progress, as it opens new opportunities for scientific and technological advance, and is instrumental in producing new knowledge leading to future applications and markets.

Despite many achievements and a high level of performance in a large number of fields, Europe is not making the most of its research potential and resources, and urgently needs a greater capacity to generate knowledge.

A Europe-wide competitive funding mechanism for frontier research executed by individual teams is a key component of the European Research Area, complementing other EU and national activities. It will help reinforce the dynamism and attractiveness of Europe for the best researchers from both European and third countries, and for industrial investment.

Activities

This action will respond to the most promising and productive areas of research and the best opportunities for scientific and technological progress, within and across disciplines, including engineering and social sciences and the humanities. It will be implemented independently of the thematic orientations of the other parts of the Framework Programme, and will pay attention to young researchers and new groups as well as established teams.

The EU activities in frontier research will be implemented by a European Research Council (ERC), consisting of a scientific council, supported by a dedicated implementation structure.

The scientific council will consist of representatives of the European scientific community at the highest level, acting in their personal capacity, independently of political or other interests. Its members will be appointed by the Commission following an independent procedure for their identification. The scientific council will, inter alia, oversee decisions on the type of research to be funded and act as guarantor of the quality of the activity from the scientific perspective. Its tasks will cover, in particular, the development of the annual work programme, the establishment of the peer review process, as well as the monitoring and quality control of the programme's implementation from the scientific perspective.

The dedicated implementation structure will be responsible for all aspects of implementation and programme execution, as provided for in the annual work programme. It will, in particular, implement the peer review and selection process according to the principles established by the scientific council and will ensure the financial and scientific management of the grants.

The implementation and management of the activity will be reviewed and evaluated at appropriate intervals to assess its achievements and to adjust and improve procedures on the basis of experience.

The European Commission will act as the guarantor of the ERC's full autonomy and integrity.

III PEOPLE

Objective

Strengthening, quantitatively and qualitatively, the human potential in research and technology in Europe, by stimulating people to enter into the researcher's profession, encouraging European researchers to stay in Europe, and attracting to Europe researchers from the entire world, making Europe more attractive to the best researchers. This will be done by putting into place a coherent set of "Marie Curie" actions, particularly taking into account the European added value in terms of their structuring effect on the European Research Area. These actions address~~ing~~ researchers at all stages of their careers, from initial research training to life long ~~learning~~training and career development.

Rationale

Abundant and highly trained qualified researchers are a necessary condition to advance science and to underpin innovation, but also an important factor to attract and sustain investments in research by public and private entities. Against the background of growing competition at world level, the development of an open **and competitive** European labour market for researchers and the diversification of skills and career paths of researchers are crucial to support a beneficial circulation of researchers and their knowledge, both within Europe and in a global setting.

Mobility, both trans-national and intersectoral, including stimulating industrial participation and the opening of research careers and academic positions at European scale, is a key component of the European Research Area and indispensable to increase European capacities and performances in research.

Activities

- **Initial training of researchers** to improve their career perspectives, in both public and private sectors, including through the broadening of their scientific and generic skills, and attracting more **people**~~young researchers~~ to scientific careers.

  This will be implemented through Marie Curie Networks with the main objective to overcome fragmentation of and to strengthen at European level the initial training and career development of researchers. Members of the trans-national networks shall exploit their complementary competencies through integrated training programmes. Support will comprise recruitment of early stage researchers, organisation of training events also open to researchers outside the network and senior chairs and/or industry positions for knowledge transfer and supervision.

- **Life-long training and career development** to support the career development of experienced researchers. With a view to complementing or acquiring new skills and competencies or to enhance inter/multidisciplinarity and/or inter-sectoral mobility, support is foreseen for researchers with particular needs for additional/complementary competences and skills, for researchers to resume a research career after a break and for (re)integrating researchers into a longer term research position in Europe, including in their country of origin, after a trans-national/international mobility experience. This action line will be implemented through both individual fellowships awarded directly at Community level and through the co-financing of regional, national or international programmes.

- **Industry-academia pathways and partnerships:** Support to longer term co-operation programmes between organisations from academia and industry, in particular SMEs, aims at increasing knowledge sharing through joint research partnerships, supported by the recruitment of experienced researchers to the partnership, by staff secondments between both sectors, and by the organisation of events.

- **The international dimension,** to increase the quality of European research by attracting research talent from outside Europe and fostering mutually beneficial **international** research collaboration ~~with~~**between** researchers~~ from outside Europe~~. This will be addressed through international outgoing fellowships (with an in-built mandatory return phase)~~;~~**,** international incoming fellowships~~;~~ **and support to international** partnerships **with** ~~to support the~~ exchange of researchers**, particularly joint** ~~. Common~~ initiatives between **a number of** European organisations and organisations **in**~~from~~ countries neighbouring the EU and countries with which the EU has a Science and Technology agreement~~ will also be supported~~. The activity will include measures to counter the risk of "brain drain" from developing countries and emerging economies and measures to create networks of European researchers working abroad. These actions will be implemented in line with the international activities under the "Co-operation" and "Capacities" Programmes.

- **Specific actions** to support the creation of a genuine European labour market for researchers, ~~by~~**including** removing obstacles to mobility~~, and~~ to enhanc**e**~~ing~~ the career perspectives of researchers in Europe**, and** ~~. Furthermore, awards~~ to improve the public awareness of Marie Curie actions**.** ~~and their objectives will be provided~~.

IV CAPACITIES

This part of the Framework Programme will enhance research and innovation capacities throughout Europe and ensure their optimal use. This aim will be achieved through:

– Optimising the use and development of research infrastructures.

– Strengthening innovative capacities of SMEs and their ability to benefit from research.

– Supporting the development of regional research-driven clusters.

– Unlocking the research potential in the EU's convergence and outermost regions.

– Bringing science and society closer together for the harmonious integration of science and technology in European society.

– Horizontal actions and measures in support of international co-operation.

The activities undertaken in this part of the Framework Programme will also support the coherent development of policies, complementing the coordination activities under the Cooperation programme, and contributing to Community policies and initiatives that aim to improve the coherence and impact of Member States policies. This will include:

– Strengthening and improving the European science system, such as questions of scientific advice and expertise and contributing to "better regulation".

– Monitoring and analysis of research related public policies and industrial strategies.

– Coordination of research policies, including trans-national cooperation initiatives undertaken at national or regional level on issues of common interest.

RESEARCH INFRASTRUCTURES

Objective

Optimising the use and development of the best research infrastructures existing in Europe, and helping to create in all fields of science and technology new research infrastructures of pan-European interest needed by the European scientific community to remain at the forefront of the advancement of research, and able to help industry to strengthen its base of knowledge and its technological know how.

Rationale

Research infrastructures play an increasing role in the advancement of knowledge and its exploitation. For example, radiation sources, data banks in genomics and data banks in social science, observatories for environmental and space sciences, systems of imaging or clean rooms for the study and development of new materials or nano-electronics, are at the core of research. They are expensive, need a broad range of expertise to be developed, and should be used and exploited by a large community of scientist and customer industries on a European scale.

The development of a European approach with regard to research infrastructures, including computing and communication based *e*-infrastructures, and the carrying out of activities in this area at Union level, can make a significant contribution to ~~boosting~~ **increasing** European research potential and its exploitation.

The EU can and should play a catalysing and leveraging role by helping to ensure wider and more efficient access to, and use of, the infrastructures existing in the different Member

States, by stimulating the development of these infrastructures in a coordinated way and by fostering the emergence of new research infrastructures of pan-European interest in the medium to long term.

Activities

Activities carried out in this field will be executed in the whole field of science and technology. They will be implemented in close cooperation with the activities taking place in the thematic areas to ensure that all the actions undertaken at European level in the EU framework respond to the needs for research infrastructures in their respective area including international cooperation.

The **main** activities**, complemented by support actions whenever appropriate,** will be the following:

- **Support to existing research infrastructures**

~~– trans-national access to ensure that European researchers may have access to the best research infrastructures to conduct their research, irrespective of the location of the infrastructure~~

– *integrating activities* to structure better, on a European scale, the way research infrastructures operate in a given field and promote their coherent use and development**, ensuring that European researchers have access to the best research infrastructures to conduct their research, irrespective of the location of the infrastructures.**

– *research e-infrastructure* by fostering the further development and evolution of high-capacity and high-performance communication and grid infrastructures and reinforcing European high-end computing capabilities, as well as fostering the adoption by user communities, enhancing their global relevance and increasing the level of trust and confidence, building on the achievements of GEANT and Grid infrastructures.

- **Support to new research infrastructures**

– ~~construction~~ **engineering** *of new infrastructures and major up*~~dates~~**grades** *of existing ones* to promote the ~~creation~~ **emergence** of new research **facilities** ~~infrastructures~~, ~~based on the work conducted by ESFRI notably, and~~ which**, in a limited number of cases,** may be decided on the basis of Article 171 of the Treaty or on the basis of Specific Programme Decisions in accordance with Article 166 of the Treaty**, building primarily upon the work conducted by ESFRI**[28].

– *design studies*, through a bottom-up approach of calls for proposals, to promote the creation of new research infrastructures by funding exploratory awards and feasibility studies for new infrastructures.

Infrastructures projects proposed for funding in this respect will be identified on the basis of a series of criteria including in particular:

[28] The European Strategy Forum on Research Infrastructures (ESFRI) was launched in April 2002. ESFRI brings together representatives of the 25 EU Member States, appointed by Ministers in charge of Research, and a representative of the European Commission. The countries associated with the Framework Programme for Research were invited to join in 2004.

– Added value of EU financial support

– Capacity to offer a service to users from the scientific (academic and industrial) community at European level

– Relevance at international level

– Technological feasibility

– Possibilities for European partnership and **strong** commitment of **Member States and other major** stakeholders

– Construction and operating costs evaluated.

As far as the construction of new infrastructures is concerned, an efficient coordination of the Community financial instruments, Framework Programme and Structural Funds in particular, will be ensured.

RESEARCH FOR THE BENEFIT OF SMEs

Objectives

Strengthening the innovation capacity of European SMEs and their contribution to the development of new technology based products and markets by helping them outsource research, increase their research efforts, extend their networks, better exploit research results and acquire technological know how.

Rationale

SMEs are at the core of European industry. They should be a key component of the innovation system and in the chain of transformation of knowledge into new products, processes and services. Faced with an increasing competition in the internal market and globally, European SMEs need to increase their knowledge and research intensity, expand their business activities on larger markets and internationalize their knowledge networks. Most Member states actions relevant to SMEs do not encourage and support trans-national research cooperation and technology transfer. Actions at EU level are necessary to complement and enhance the impact of actions undertaken at national and regional level. In addition to the actions listed below, the participation of SMEs will be encouraged and facilitated, and their needs taken into account, across the Framework Programme.

Activities

Specific actions in support to SMEs are conceived to support SMEs or SME associations in need of outsourcing research to universities and research centres: mainly low to medium tech SMEs with little or no research capability. Research intensive SMEs who need to outsource research to complement their core research capability may also participate. Actions will be carried out in the entire field of science and technology. Financial means will be allocated through two schemes:

– ***Research for SMEs:*** To support small groups of innovative SMEs to solve common or complementary technological problems

– ***Research for SME associations:*** To support SME associations and SME groupings to develop technical solutions to problems common to large numbers of SMEs in specific industrial sectors or segments of the value chain.

During the implementation of the Community RTD Framework Programme, complementarity and synergy will be ensured with the actions of the Competitiveness and Innovation Framework Programme. ~~The Competitiveness and Innovation Programme will provide support to networks of intermediaries and national schemes for actions to encourage and facilitate the participation of SMEs in the Framework Programme.~~

REGIONS OF KNOWLEDGE

Objectives

Strengthening the research potential of European regions, in particular by encouraging and supporting the development, across Europe, of regional "research-driven clusters" associating universities, research centres, enterprises and regional authorities.

Rationale

Regions are increasingly recognised as important players in the EU's research and development landscape. Research policy and activities at regional level often rely on the development of "clusters" associating public and private actors. The *Pilot Action* on "*Regions of Knowledge*" demonstrated the dynamic of this evolution and the necessity to support and encourage the development of such structures.

The actions undertaken in this area will enable European regions to strengthen their capacity for investing in RDT and carry out research activities, while maximising their potential for a successful involvement of their operators in European research projects.

Activities

The new *Regions of Knowledge* initiative will involve and bring together regional actors involved in research: universities, research centres, industry, public authorities (regional councils or regional development agencies). Projects will cover joint analysis of research agendas of regional clusters (in coordination with other activities on the broader issue of regional innovation clusters) and the elaboration of a set of instruments to address them in specific research activities, including through "mentoring" of regions with a less developed research profiles by highly developed ones. This will comprise measures aiming at improving research networking and access to sources of research funding as well as better integration of research actors and institutions in regional economies. These activities will be implemented in close relationship with EU regional policy and the Competitiveness and Innovation Programme and the Education and Training Programmes.

In the context of the specific activity of "Regions of Knowledge" synergies will be sought with the EU's regional policy, in particular with regard to convergence and outermost regions.

RESEARCH POTENTIAL

Objective

Stimulating the realisation of the full research potential of the enlarged Union by unlocking and developing the research potential in the EU's convergence regions and outermost regions[29], and helping to strengthen the capacities of their researchers to successfully participate in research activities at EU level.

Rationale

Europe does not fully exploit its research potential, in particular in less advanced regions remote from the European core of research and industrial development. In order to help researchers and institutions of these regions to contribute to the overall European research effort, while taking advantage of the knowledge and experience existing in other regions of Europe, this action aims at establishing the conditions that will allow them to exploit their potential and will help to fully realise the European Research Area in the enlarged Union.

Activities

The action in this domain ~~will~~ comprise**s** support to:

- Trans-national two-way secondments of research staff between selected organisations in the convergence regions, and one or more partner organisations; the recruitment by selected centres of incoming experienced researchers from other EU countries;

- The acquisition and development of research equipment and the development of a material environment enabling a full exploitation of the intellectual potential present in the selected centres in the convergence regions;

- The organisation of workshops and conferences to facilitate knowledge transfer; promotion activities as well as initiatives aiming at disseminating and transferring research results in other countries and on international markets.

- **Independently of these support measures** "E**e**valuation facilities" **will be provided** through which ~~any~~ research centre**s** in the convergence regions can obtain an international independent expert evaluation of the level of their overall research quality and infrastructures.

Strong synergies will be sought with the EU's regional policy. Actions supported under this heading will identify needs and opportunities for reinforcing the research capacities of emerging and existing centres of excellence in convergence regions which may be met by Structural and Cohesion funds.

SCIENCE IN SOCIETY

Objective

With a view to building an effective and democratic European Knowledge society, the aim is to stimulate the harmonious integration of scientific and technological endeavour, and associated research policies in the European social web, by encouraging at

[29] Convergence regions are those set out in Article 5 of the proposal for a Council Regulation laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund - COM(2004) 492. This includes "convergence" objective regions, regions eligible for funding from the Cohesion fund, and outermost regions.

European scale reflection and debate on science and technology~~, and their relation with society and culture~~**.**

Rationale

The influence of science and technology on our daily lives becomes increasingly profound. Products of the social activity and shaped by social and cultural factors, science and technology nevertheless remain a remote domain far from the daily concerns of a large part of the public and of policy decision makers, and continues to be the subject of misunderstandings and unfounded hopes and fears. Contentious issues relating to emerging technologies should be addressed by society on the basis of well informed debate leading to sound choices and decisions.

Activities

The ~~substantial and integrated initiative~~ **activities** undertaken in this field will comprise support to:

- ~~Strengthening and improvement of the European science system, including: questions of scientific advice and expertise; the future of scientific publications; safeguards for scientific domains open to misuse; and frauds, trust and "self regulation".~~

- Broader engagement of researchers and the public at large~~,~~ including organised civil society, ~~on science-related questions,~~ to anticipate and clarify political and societal issues **related to science**, including ethical issues**, while strengthening the European science system, including the following issues: scientific advice and expertise; scientific publications; trust and "self regulation" as well as** .

- ~~Reflection and debate~~ **specific research** on science and technology and their place in **the European** society~~, drawing on history, sociology and philosophy of science and technology.~~

- Gender research, including the integration of the gender dimension in all areas of research and the role of women in research.

- Creation of an environment which triggers curiosity for science in young people, by reinforcing science education at all levels including schools and promoting interest and participation in science among young people.

- **Actions in favour of reinforcing** ~~Development of a policy on~~ the role of universit**y**~~ies~~ **based research in order** ~~and the engagement of universities in the necessary reforms~~ to face the challenges of globalisation.

- Improved communication between the scientific world and the wider audience of policy-makers, the media and the general public, by helping scientists better communicate their work and by supporting scientific information and media.

These activities will take the form of, in particular, **targeted** research projects, studies, networking and exchanges, public events and initiatives, prizes, surveys and data collection. In many cases they will imply international partnerships with organisations from third countries.

ACTIVITIES OF INTERNATIONAL CO-OPERATION

To become competitive and play a leading role at world level, the European Community needs a strong and coherent international science and technology policy.

This international policy has two interdependent objectives:

- To support European competitiveness through strategic partnerships with third countries in selected fields of science and by engaging the best third country scientists to work in and with Europe;
- To address specific problems that third countries face or that have a global character, on the basis of mutual interest and mutual benefit.

Cooperation with third countries in the Framework Programme will be targeted in particular at the following groups of countries:

- Candidate countries;
- ~~Countries neighbouring the EU, Mediterranean partner countries, Western Balkans and the Newly Independent States;~~ **Mediterranean partner countries (MPC), Western Balkans countries (WBC)[30] as well as the Eastern European and Central Asian countries[31] (EECA);**
- Developing countries, focusing on their particular needs;
- Emerging economies.

The theme-oriented international cooperation actions are carried out under the "Cooperation" programme. The international actions in the area of human potential are carried under the "People" programme.

- Under the "Capacities" programme, horizontal support actions and measures with a focus other than a specific thematic or interdisciplinary area will be implemented. ~~Efforts will be undertaken to improve the coherence of national activities by supporting the co-ordination of national programmes on international scientific co-operation.~~ **The focus will be on bi-regional coordination of S&T Cooperation including priority setting and definition of S&T Cooperation policies[32]; bilateral S&T coordination platforms for the enhancement and development of S&T Cooperation Partnerships; and supporting the co-ordination of national policies and activities on international S&T co-operation.**

The overall coordination of the international cooperation actions under the different programmes of the Framework Programme **(as well as with other Community instruments)** will be ensured.

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30 **Other than Candidate countries**

31 **Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.**

32 **With targeted third countries (International Cooperation Partner Countries as defined in the Rules for participation and dissemination).**

NON NUCLEAR ACTIONS OF THE JOINT RESEARCH CENTRE

Objective

To provide customer driven scientific and technical support to the EU policy making process, ensuring support to the implementation and monitoring of existing policies and responding to new policy demands.

Rationale

The JRC's independence of special interests, whether private or national, combined with its technical expertise enable it to facilitate communication and consensus building between stakeholders (industry associations, environmental action groups, Member States' competent authorities, other research centres etc.) and policy makers, especially at the EU level. Through scientific and technological support the JRC helps to make the EU policy process more effective, transparent and based on sound science.

The usefulness and credibility of the JRC's support to EU policies is closely linked to the quality of its scientific expertise and its integration in the international scientific community. The JRC will therefore continue investing in research and networking with other centres of excellence in relevant fields. It will participate in indirect actions in all its aspects with emphasis on common scientific reference systems, networking, training and mobility, research infrastructure and participation in Technology Platforms and co-ordination instruments where it has the relevant expertise to produce added value.

The JRC will actively pursue promoting the integration of New Member States and Candidate Countries in its activities to the level currently enjoyed by the EU15.

Activities

The JRC's priorities will be in fields which are strategically important for the Union and where its input provides high added value. Scientific and technical support to EU policies will continue to be delivered in core areas such as sustainable development, climate change, food, energy, transport, chemicals, alternative methods to animal testing, research policy, information technologies, reference methods and materials, biotechnology, risks, hazards and socio-economic impacts. Growth will be in areas of key concern for the Union:

- **Prosperity in a knowledge-intensive society**

– To carry out and develop advanced econometric modelling and analysis techniques in the context of policy definition and monitoring such as the follow-up of the Lisbon agenda, the Internal Market and the Research and Education Policies.

– To develop models to support a new balance between sustainability objectives and competitiveness in a responsible way.

- **Solidarity and responsible management of resources**

– To become a recognised S&T reference centre on sustainable agriculture focusing on food quality, traceability and safety (including GM food and feed), spatial management and cross-compliance and to support the implementation of the CAP.

– To provide S&T support to the Common Fisheries Policy.

– To enhance the provision of harmonised European geo-referenced data and spatial information systems (support to INSPIRE) and to continue developing new approaches to global environmental and resources monitoring (support to GMES).

– To support the implementation of the EU Action Plan on Environment and Health including providing support to on-going activities to establish a community integrated Environment and Health information system.

- **Security and freedom**

– To develop activities contributing to the establishment of freedom, justice and security especially in areas related to fighting terrorism, organised crime and fraud, border security and prevention of major risks, in relation with law enforcement agencies and relevant EU services.

– To support the Community response to natural and technological disasters.

- **Europe as world partner**

– To strengthen support to EU external policies in specific areas such as external aspects of internal security, development cooperation and humanitarian aid.

ANNEX II: INDICATIVE BREAKDOWN AMONG PROGRAMMES

The indicative breakdown among programmes is as follows (in EUR million):

Cooperation [*,33]	**[]**~~44432~~
Health	~~8317~~
Food, Agriculture and Biotechnology	~~2455~~
Information and Communication Technologies	~~12670~~
Nanosciences, Nanotechnologies, Materials and new Production Technologies	~~4832~~
Energy	~~2931~~
Environment (including Climate Change)	~~2535~~
Transport (including Aeronautics)	~~5940~~
Socio-economic Sciences and the Humanities	~~792~~
Security and Space	~~3960~~
Ideas	~~11862~~
People	~~7129~~
Capacities	~~7486~~
Research Infrastructures *	~~3961~~
Research for the benefit of SMEs	~~1901~~
Regions of Knowledge	~~158~~
Research Potential	~~554~~
Science in Society	~~554~~
Activities of International Co-operation	~~358~~

[33] Including Joint Technology Initiatives (including financial plan, etc) and the part of the coordination and international cooperation activities to be funded within the themes.

Non-nuclear actions of the Joint Research Centre	~~1817~~
TOTAL	~~72726~~

* Including a ~~grant~~ **contribution** to the European Investment Bank for the constitution of the "Risk-Sharing Finance Facility" referred to in Annex III. The Council decisions adopting the contributing specific programmes shall establish (a) their maximum contribution ~~to the grant~~, and (b) the modalities under which the Commission shall decide on the reallocation of incomes generated by the ~~grant~~**Community contribution** and of any of its leftovers during the lifetime of the seventh framework programme.

ANNEX III : FUNDING SCHEMES

Indirect Actions

The activities supported by the 7th Framework Programme will be funded through a range of "Funding schemes". These schemes will be used, either alone or in combination, to fund different categories of actions implemented throughout the Framework Programme.

The decisions for specific programmes, work programmes and calls for proposals will mention, as and when appropriate:

- The type(s) of scheme(s) used to fund different categories of actions;
- The categories of participants (such as research organisations, universities, industry, public authorities) which can benefit from it;
- The types of activities (research, development, demonstration, training, dissemination, transfer of knowledge and other related activities) which can be funded through each of them.

Where different funding schemes can be used, the work programmes may specify the funding scheme to be used for the topic on which proposals are invited.

The funding schemes are the following:

a) To support actions which are primarily implemented on the basis of calls for proposals:

1. Collaborative projects

Support to research projects carried out by consortia with participants from different countries, aiming at developing new knowledge, new technology, products or common resources for research. The size, scope and internal organisation of projects can vary from field to field and from topic to topic. Projects can range from small or medium-scale focused research actions to larger integrating projects which mobilise a significant volume of resources for achieving a defined objective.

2. Networks of Excellence

Support to joint research programmes implemented by a number of research organisations integrating their activities in a given field, carried out by research teams in the framework of longer term co-operation. The implementation of these joint programmes will require a formal commitment from the organisations integrating part of their resources and their activities.

3. Coordination and support actions

Support to activities aimed at coordinating or supporting research activities and policies (networking, exchanges, trans-national access to research infrastructures,

studies, conferences, etc). These actions may also be implemented by means other than calls for proposals.

4. Individual projects

Support to projects carried out by individual research teams. This scheme will mainly be used to support investigator-driven "frontier" research projects funded in the framework of the European Research Council.

5. Support for training and career development of researchers

Support for training and career development of researchers, mainly used for the implementation of the Marie Curie actions.

6. Research for the benefit of specific groups (in particular SMEs)

Support to research projects where the bulk of the research is carried out by universities, research centres or other legal entities, for the benefit of specific groups, in particular SMEs or associations of SMEs.

b) To support actions implemented on the basis of decisions by the Council and the European Parliament[34], based on a proposal from the Commission, the Community will provide financial support to multi-financed large-scale initiatives.

- A financial contribution from the Community to the joint implementation of well identified national research programmes, on the basis of Article 169 of the Treaty. This joint implementation will require the establishment or existence of a dedicated implementation structure. Community financial support will be provided subject to the definition of a financing plan based on formal commitments from competent national authorities.

- A financial contribution from the Community to the implementation of Joint Technology Initiatives to realise objectives that cannot be achieved through the funding schemes identified in point 1 above. Joint Technology Initiatives will mobilise a combination of funding of different nature and from different sources, private and public, European and national. This funding can take different forms and can be allocated or mobilised though a range of mechanisms: support from the Framework Programme, loans from the European Investment Bank, support to risk capital. Joint Technology Initiatives may be decided and implemented on the basis of Article 171 of the Treaty (this may include the creation of joint undertakings) or through the Specific Programme Decisions. Community support will be provided subject to the definition of an overall blueprint of financial engineering, based on formal commitments from all parties concerned.

- A financial contribution from the Community to the development of new infrastructures of European interest. This contribution may be decided on the basis of Article 171 of the Treaty or through the Specific Programme Decisions. The development of new infrastructures will mobilise a combination of funding

[34] Or by the Council in consultation with the European Parliament

of different nature and origin: national funding, Framework Programme, Structural funds, loans from the European Investment Bank and others. Community support will be provided subject to the definition of an overall financial plan based on a formal commitment from all parties concerned.

The Community will implement the funding schemes in compliance with the provisions of the regulation adopted pursuant to Article 167 of the Treaty, the relevant State Aid instruments, in particular the Community framework for state aid to research and development, as well as international rules in this area. In compliance with this international framework, it will be necessary to be able to adjust the scale and form of financial participation on a case-by-case basis, in particular if funding from other public sector sources is available, including other sources of Community financing such as the European Investment Bank (EIB).

In addition to direct financial support to participants, the Community will improve their access to EIB loans through the "Risk-Sharing Finance Facility" by providing a ~~grant~~**contribution** to the Bank. The Community ~~grant~~**contribution** shall be used by the Bank, in addition to its own funds, to cover the provisioning and capital allocation for its loan financing. Subject to and in accordance with modalities to be established by the regulation adopted pursuant article 167 of the Treaty and the Council decisions adopting the specific programmes, this mechanism will enable broader EIB lending to European RTD actions (such as joint technology initiatives, large projects-including Eureka projects, and new research infrastructures).

In the case of participants to an indirect action established in a region lagging in development (convergence regions and outermost regions[35]), complementary funding from the Structural Funds will be mobilised wherever possible and appropriate. In the case of participation of entities from the candidate countries, an additional contribution from the pre-accession financial instruments could be granted under similar conditions. As regards actions in the "research infrastructures" part of the "capacities" programme of the 7th Framework Programme, the detailed funding arrangements for these will be defined with a view to ensuring that there is effective complementarity between community research funding and other EU and national instruments, notably the Structural Funds.

Direct actions

The Community will undertake activities implemented by the Joint Research Centre, which are referred to as direct actions.

[35] Convergence regions are those set out in Article 5 of the proposal for a Council Regulation laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund - COM(2004) 492. This includes "convergence" objective regions, regions eligible for funding from the Cohesion fund, and outermost regions.

LEGISLATIVE FINANCIAL STATEMENT

[TO BE ADDED]

EXPLANATORY MEMORANDUM (Euratom)

1. Context of the proposal

The proposals for the European Atomic Energy Community (Euratom) 7th Framework Programme and the two Specific Programmes[36] for nuclear research and training activities (2007-2011) have been revised from the Commission's original proposals[37] to take account of the reduced budget for the Financial Perspectives 2007-13. Compared to the Commission's original proposals this represents a reduction of approximately 14% in the budget over the period 2007-13.

Community level funding of research has been recognised by the Council and Parliament as having a unique importance for the creation of a knowledge economy and society. Within the agreed Community budget, research spending will increase by 75% in real terms in 2013 from the amount spent in 2006. The average annual budget will be approximately 60% higher than in the 6th Framework Programme and marks a significant expansion in Community funded research activities. On this basis the proposed 7th Framework Programme will have substantial economic, social and environmental benefits for Europe. At the same time, the reduced budget represents a missed opportunity to address Europe's needs and achieve the objectives to the extent set out in the original Commission proposals. This issue should be a key element in the review of the financial perspectives in 2009, particularly in what concerns international commitments.

The objectives which the initial proposals sought to achieve are of increasing importance.[38] Research investment in Europe is slipping further behind major competitors, yet the need for new knowledge is critical for the jobs and industries of the future and for addressing the challenges of sustainable development. Furthermore, the original Commission proposals have received a wide level of support from the other European Institutions, researchers, industry, research users and other stakeholders. Given the relevance of the objectives, the Commission has maintained the structure and philosophy of the initial proposals while focusing the available budget in order to maximise impacts and to leverage and complement other sources of funding for research. In this respect, increasing research investments by national governments and the private sector towards the objective of 3% of GDP is more important than ever.[39]

The attached proposals represent an intermediate stage in advance of the Commission's revised proposal, which will follow the Council's common position. Substantial progress has been achieved in the inter-institutional debate on the Framework Programme and Specific Programme decisions. In November 2005, the Council agreed a Partial General Agreement on the 7th Framework Programme. Extensive debate is ongoing in the Parliament, although no definitive opinions have yet been reached. All of this debate demonstrates a broad degree of consensus following the Commission's original proposals and a strong basis for timely decisions on the 7th Framework Programme. In order to facilitate this debate as much as possible and allow the Parliament and Council to continue their deliberations, the revised proposals focus on those aspects which require modification

[36] The Specific Programme proposals are not included at this stage.
[37] COM(2005)444; COM(2005)445
[38] As set out in *Building the ERA of Knowledge*, COM(2005) 118
[39] A comprehensive set of actions is laid out in *An action plan to boost research and innovation*, COM (2005)488

to accommodate the reduced budget. The Commission will continue to act constructively to facilitate agreements as soon possible and will respond formally to the Inter-Institutional debate on the 7th Framework Programme.

2. Prior consultation and impact assessment

Extensive analysis and stakeholder consultations were undertaken for the development of the initial Commission proposals and were presented in the Impact Assessment that accompanied the 7th Framework Programme proposal[40]. The results in terms of the added value of increased Community level investment in research and the proposed objectives and approach of the 7th Framework Programme remain valid for the revised proposal. However, the extent of the impacts will be less given the reduced budget available, and to achieve the desired level of impact will require stronger R&D efforts on the part of Member States, with more effective coordination between the EU, national and regional levels.

3. Legal aspects

The present Specific Programme proposals cover the same period as the Framework Programme 2007-2011, which in turn is based on Article 7 of the Euratom Treaty. In accordance with this Article, second paragraph, research proposals are drawn up for a period of not more than five years. Hence the present proposals are not for the same duration as the EC Specific Programmes.

The Commission proposes that, unless extenuating circumstances arise, these Specific Programmes will be renewed for the period 2012-2013, in accordance with the foreseen legislative procedure.

4. Budgetary implication

The "legislative financial statement" attached to this Decision sets out the budgetary implications and the human and administrative resources.

5. Content of Revised Proposal

The revised proposals maintain the same structure, objectives and philosophy of the Commission's original proposals. This reflects the vital importance of the objectives, and the need to minimise the adverse consequences of the reduction in budget and to build on the strong level of support and consensus for the original proposals. The overall objective of each specific programme has been maintained, as have the objectives of each thematic area. Simplification of the implementation of the 7th Framework Programme remains of paramount importance.

While the broad balance of funding within specific programmes has been respected, account has been taken of prior commitments that have been entered into. These relate primarily to the Community contribution to the ITER project.

The reduction in budget does, however, require a more targeted approach to the implementation of the indirect actions Specific Programme, in particular:

[40] SEC(2005)430

- Stricter prioritisation in the annual work programmes in all thematic areas and especially in all decisions relating to the funding of new infrastructures, while maintaining the necessary flexibility for a five year programme;

- Increased coherence between the EC and Euratom Specific Programmes, through consolidation of security research under the security theme of the EC Cooperation Specific Programme

The reduced budget will have a major impact in terms of the depth and completeness which this content can be supported. The effect of the budget reduction is that greater prioritisation will be required in the implementation of the indirect actions Specific Programme. At the same time, it is vital to maintain sufficient flexibility such that new needs, opportunities and priorities can be accommodated during the five year period of implementation.

The necessary prioritisation will be undertaken, to a large extent, in the annual work programmes under these specific programmes which will target well-focused areas for calls for proposals. Furthermore, this may mean that funding of some topics will be delayed until later years. A number of minor changes are, however, also required in the description of the thematic content in the legislative proposals. In a small number of cases, areas or topics have been removed as it is no longer considered possible for them to be funded.

6. Towards the launch of the 7th Framework Programme

The 7th Framework Programme will provide a major impetus towards the knowledge economy and society in Europe. In order to build on the achievements of the 6th Framework Programme, there should be no gap in funding with the transition to the 7th Framework Programme, which would adversely affect the European research community at a critical time and risk losing momentum in European research efforts.

The timely launch of the 7th Framework Programme will require the commitment and constructive engagement of all parties.

The debate in the Council and Parliament must now accelerate, consolidating on the substantial progress that has been made since the original proposals were adopted in April 2005. The Commission, for its part, will do all it can to facilitate this debate and ensure the timely adoption of the Council and Parliament decisions.

Simplification is of key importance, and the Commission will accelerate its preparations for the implementation of the Framework Programme, in close liaison with stakeholders, such that the necessary documents and guidance are available on time.

Throughout these endeavours the ongoing support and engagement of the research community and other stakeholders is critically important, such that their views are properly expressed and Europe can have a Framework Programme that truly meets its needs.

Revised proposal for a

COUNCIL DECISION

concerning the seventh framework programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities (2007 to 2011)

ADDITIONS TO THE COMMISSION PROPOSAL COM(2005)119 ARE SHOWN IN UNDERLINING AND DELETIONS WITH ~~STRIKE THROUGH.~~

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Atomic Energy Community, and in particular Article 7 thereof,

Having regard to the proposal from the Commission[41],

Having regard to the opinion of the European Parliament[42],

Having regard to the opinion of the European Economic and Social Committee[43],

Whereas:

(1) Joint national and European efforts in the area of research and training are essential to promote and ensure economic growth and citizen's wellbeing in Europe.

(2) The seventh framework programme complements other EU actions in the area of the research policy that are necessary for the implementation of the Lisbon strategy, alongside in particular those on education, training, competitiveness and innovation, industry, employment, and environment.

(3) This framework programme builds on the achievements of its predecessor towards the creation of the European Research Area, and carries them further towards the development of the knowledge economy and society in Europe.

(5) The Commission Green Paper 'Towards a European strategy for energy supply' highlights the contribution of nuclear power in reducing emissions of greenhouse gases and in reducing Europe's dependence on imported energy.

(6) With reference to the Council Decision of 26 November 2004 amending the directives of negotiations on ITER[44], the realisation of ITER in Europe, in a broader

41 OJ C , , p. .
42 OJ C , , p. .
43 OJ C , , p. .
44 Not published in the OJ.

approach to fusion energy, will be the central feature of the activities on fusion research carried out under the seventh framework programme

(7) Implementation of the seventh framework programme may give rise to the setting up of joint undertakings within the meaning of Title II, Chapter 5 of the Treaty.

(8) Research activities supported by this Framework Programme should respect fundamental ethical principles, including those reflected in the Charter of Fundamental Rights of the European Union. The opinions of the European Group on Ethics in Science and New Technologies are and will be taken into account.

(9) This act establishes a financial framework for the entire duration of the programme which is to be the principal point of reference for the budgetary authority, within the meaning of point …. of the Interinstitutional Agreement of …. between the European Parliament, the Council and the Commission on budgetary discipline and improvement of the budgetary procedure.

(10) On **24 August** 2005 the Commission submitted the conclusions of the external assessment of the implementation and results of the Community activities carried out in the five years preceding that assessment, accompanied by its observations.

(11) It is important to ensure sound financial management of the seventh framework programme and its implementation in the most effective and user-friendly manner possible, as well as ease of access for all participants.

(12) Under the seventh Framework Programme due regard will be paid to the role of women and science and research with a view to further enhancing their active role in research.

(13) The Joint Research Center should contribute to the attainment of the objectives set out above by carrying out direct activities and by providing customer-driven support for the implementation of EU policies.

(14) The international and global dimension in European research activities is important in the interest of obtaining mutual benefits. The seventh Framework Programme is open to the participation of countries having concluded the necessary agreements to this effect, and is also open, on the project level and on the basis of mutual benefit, to the participation of entities from thirds countries and of international organisations for scientific cooperation.

(15) The seventh Framework Programme should contribute to enlargement by bringing scientific and technological support to the candidate countries for the implementation of Community *acquis* and for their integration into the European Research Area.

(16) Appropriate measures should also be taken to prevent irregularities and fraud and the necessary steps should be taken to recover funds lost, wrongly paid or incorrectly used in accordance with Council Regulations (EC, Euratom) No 2988/95 of 18 December 1995 on the protection of the European Communities financial

interests[45], (EC, Euratom) No 2185/96 of 11 November 1996 concerning on-the-spot checks and inspections carried out by the Commission in order to protect the European Communities' financial interests against fraud and other irregularities[46] and Regulation (EC) No 1074~~3~~/1999 of the European Parliament and of the Council concerning investigations conducted by the European Anti-Fraud Office (OLAF)[47].

(17) The Scientific and Technical Committee has been consulted by the Commission and has delivered its opinion.

HAS DECIDED AS FOLLOWS:

Article 1

Establishment of the research and training framework programme

A multiannual framework programme for nuclear research and training activities, hereinafter referred to as the "seventh framework programme" is hereby established for the period from 1 January, 2007 to 31 December , 2011.

Article 2

Objectives

1. The seventh Framework programme shall pursue the general objectives set out in Article 1 and Article 2(a) of the Treaty, while contributing towards the creation of a knowledge-based society, building on a European Research Area.

2. The seventh framework programme shall comprise Community research, technological development, international cooperation, dissemination of technical information and exploitation activities as well as training, to be set out in two specific programmes:

   The first programme shall cover the following:

   (a) **Fusion energy research**, with the objective of developing the technology for a safe, sustainable, environmentally responsible and economically viable energy source;

   (b) **Nuclear fission and radiation protection** with the objective of promoting the safe use and exploitation of nuclear fission and other uses of radiation in industry and medicine.

   The second programme shall cover the activities of the Joint Research Centre in the field of nuclear energy.

3. The broad lines of the programmes are described in Annex I.

[45] OJ L 312, 23.12.1995, p. 1.
[46] OJ L 292, 15.11.1996, p. 2.
[47] OJ L 136, 31.5.1999, p. 1.

Article 3

Maximum overall amount and shares assigned to each programme

1. The overall amount for the implementation of the seventh framework programme for the period 2007 to 2011 shall be EUR ~~3092~~ million. That amount shall be distributed as follows (in EUR million):

(a)	Fusion energy research	~~2159~~
(b)	Nuclear Fission and radiation protection	~~394~~
(c)	Nuclear Activities of the Joint Research Centre	~~539~~

2. The detailed rules for Community financial participation in this Framework programme are set out in Annex II.

Article 4

Protection of the Communities' financial interests

For the Community actions financed under this Decision, Regulation (EC, Euratom) No 2988/95 and Regulation (EC, Euratom) No 2185/96 shall apply to any infringement of a provision of Community law, including infringement of a contractual obligation stipulated on the basis of the programme, resulting from an act or omission by an economic operator, which has, or would have, the effect of prejudicing the general budget of the European Communities or budgets managed by them, by an unjustified item of expenditure.

Article 5

All the research activities carried out under the seventh Framework Programme shall be carried out in compliance with fundamental ethical principles.

Article 6

Monitoring, assessment and review

1. Not later than 2010, the Commission shall carry out, with the assistance of external experts, an interim evaluation of this framework programme and its specific programmes on the quality of the research activities under way, progress towards the objectives set and the scientific and technical results achieved.

2. Following the completion of this framework programme, the Commission shall carry out an external evaluation by independent experts of its rationale, implementation and achievements.
   The Commission shall communicate the conclusions thereof, accompanied by its observations, to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.

Done at Brussels,

For the Council
The President

ANNEX I : SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES, THEMES AND ACTIVITIES

INTRODUCTION

The 7th EURATOM Research Framework Programme is organised in two parts corresponding to the "'indirect" actions on fusion energy research and nuclear fission and radiation protection, and the "direct" research activities of the Joint Research Centre.

FUSION ENERGY RESEARCH

Objective

Developing the knowledge base for, and realising ITER as the major step towards, the creation of prototype reactors for power stations which are safe, sustainable, environmentally responsible, and economically viable.

Rationale

There are serious shortcomings in Europe's energy supply with respect to near, medium, and long-term considerations. In particular, measures are needed to address the issues of security of supply, climate change, and sustainable development, while ensuring that future economic growth is not threatened.

Fusion has the potential to make a major contribution to the realisation of a sustainable and secure supply for the EU in a few decades from now. Its successful development would provide energy which is safe, sustainable and environmentally friendly. The long-term goal of European fusion research, embracing all the fusion activities in the Member States and associated third countries, is the joint creation of prototype reactors for power stations which meet these requirements, and are economically viable.

The strategy to achieve the long-term goal entails, as its first priority, the construction of ITER (a major experimental facility which will demonstrate the scientific and technical feasibility of fusion power), followed by the construction of DEMO, a "demonstration" fusion power station. This will be accompanied by a dynamic programme of supporting R&D for ITER and for the developments in fusion materials, technologies and physics required for DEMO. This would involve European industry, the fusion Associations and third countries, in particular Parties to the ITER Agreement.

Activities

- **The realisation of ITER**

This includes activities for the joint realisation of ITER (as an international research infrastructure), in particular for site preparation, establishing the ITER Organisation and the European Joint Undertaking for ITER, management and staffing, general technical and administrative support, construction of equipment and installations and support to the project during construction.

- **R&D in preparation of ITER operation**

A focused physics and technology programme will exploit **suitable** ~~the~~ facilities and resources in the fusion programme, including JET. It will assess specific key ITER technologies, consolidate ITER project choices, and prepare for ITER operation through experimental and theoretical activities.

- **Technology activities in preparation of DEMO**

This entails the vigorous development of fusion materials and key technologies for fusion, and **as part of the Broader Approach,** the establishment of a dedicated project team to prepare for the construction of the International Fusion Materials Irradiation Facility (IFMIF) to qualify materials for DEMO. It will include irradiation testing and modelling of materials, studies of the DEMO conceptual design, and studies of the safety, environmental and socio-economic aspects of fusion energy.

- **R&D activities for the longer term**

The activities will include further development of improved concepts for magnetic confinement **devices** ~~schemes~~ with potential advantages for Fusion power stations (~~focussed on~~**in particular** the **timely** completion of the construction of the W7-X stellarator device), theory and modelling**, with a focus on the development of the understanding necessary for the appraisal of the potential for improvement, and on the optimisation of power station design.** ~~aimed at a comprehensive understanding of the behaviour of fusion plasmas and co-ordination, in the context of a keep-in-touch activity, of Member States' civil research activities on inertial confinement.~~

- **Human resources, education and training**

In view of the immediate and medium term needs of ITER, and for the further development of fusion, initiatives aimed at ensuring that adequate human resources will be available, in terms of numbers, range of skills and high level training and experience will be pursued.

- **Infrastructures**

The construction of the international fusion energy research project ITER will be an element of the new research infrastructures with a strong European dimension.

NUCLEAR FISSION AND RADIATION PROTECTION

Objective

Establishing a sound scientific and technical basis in order to accelerate practical developments for the safer management of long-lived radioactive waste, promoting safer, more resource-efficient and competitive exploitation of nuclear energy and ensuring a robust and socially acceptable system of protection of man and the environment against the effects of ionising radiation.

Rationale

Nuclear power currently generates one third of all electricity consumed in the EU and is the most significant source of carbon-free base-load electricity presently available. The European

nuclear sector as a whole is typified by cutting-edge technology and provides highly skilled employment for several hundred thousand people. As an indigenous and dependable source of energy, nuclear power contributes to the EU's independence and security of supply, with more advanced nuclear technology offering the prospect of significant improvements in efficiency and use of resources, at the same time ensuring even higher safety standards and producing less waste than current designs.

There are, however, important concerns that affect the continued use of this energy source in the EU. The key issues are operational reactor safety and management of long-lived waste, both of which are being addressed through continued work at the technical level, though allied political and societal inputs are also required. In all uses of radiation, throughout industry and medicine alike, the overriding principle is the protection of man and the environment. All thematic domains to be addressed here are characterised by an overriding concern to ensure high levels of safety. Similarly there are clearly identifiable needs throughout nuclear science and engineering relating to availability of research infrastructures and expertise. In addition, the individual technical areas are linked by key cross-cutting topics such as the nuclear fuel cycle, actinide chemistry, risk analysis and safety assessment and even societal and governance issues.

Research will also be needed to explore new scientific and technological opportunities and to respond in a flexible way to new policy needs that arise during the course of the Framework Programme.

Activities

- **Management of radioactive waste**

Implementation oriented research and development activities on deep geological disposal of spent fuel and long-lived radioactive waste and, as appropriate, demonstration on the technologies and safety, and to underpin the development of a common European view on the main issues related to the management and disposal of waste. Research on partitioning and transmutation and/or other concepts aimed at reducing the amount and/or hazard of the waste for disposal.

- **Reactor systems**

Research to underpin the continued safe operation of existing reactor systems (including fuel cycle facilities), taking into account new challenges such as life-time extension and development of new advanced safety assessment methodologies (both the technical and human element), and to assess the potential and safety aspects of future reactor systems in the short and medium term, thereby maintaining the high safety standards already achieved within the EU.

- **Radiation protection**

Research, in particular on the risks from low doses, on medical uses and on the management of accidents, to provide the scientific basis for a robust, equitable and socially acceptable system of protection that will not unduly limit the beneficial and widespread uses of radiation in medicine and industry (including the generation of nuclear energy). ~~Research to minimise the threat posed by nuclear and radiological terrorism and mitigate its impact.~~

- **Infrastructures**

To support the availability of research infrastructures such as material test reactors, underground research laboratories and radiobiology facilities and tissue banks, necessary to maintain high standards of technical achievement, innovation and safety in the European nuclear sector.

- **Human resources and training**

To support the retention and further development of scientific competence and human capacity in order to guarantee the availability of suitably qualified researchers and employees in the nuclear sector over the longer term.

NUCLEAR ACTIVITIES OF THE JOINT RESEARCH CENTRE

Objective

To provide customer driven scientific and technical support to the EU policy making process in the nuclear field, ensuring support to the implementation and monitoring of existing policies while flexibly responding to new policy demands.

Rationale

The Joint Research Centre supports the objectives of the European strategy for energy supply, particularly to help matching the Kyoto objectives. The EU has a recognised competence in many aspects of nuclear technology, and this is built on a solid basis of past successes in the domain. The usefulness of the JRC in its support to EU policies and in its contribution to the new trends in nuclear research are based on its scientific expertise and its integration in the international scientific community. On the one hand the JRC has competent staff and state-of-the-art facilities to carry out recognized scientific/technical work; and on the other hand it supports the policy of the EU to maintain basic competencies and expertise for the future by training young scientists and fostering their mobility. New demand has emerged in particular in the external relations and security related policies. In these cases, in-house and secure information/analyses/systems are needed which cannot always be obtained on the market.

The nuclear activities of the JRC aim to satisfy the R&D requirements to support both Commission and Member States. The objective of this programme is to develop and assemble knowledge, to provide input to the debate on nuclear energy production, its safety and reliability, its sustainability and control, its threats and challenges, including innovative/future reactor systems.

Activities

The JRC activities will focus on:

Nuclear Waste Management and Environmental Impact aiming to understand the nuclear fuel processes from production of energy to waste storage and to develop effective solutions for the management of high level nuclear waste following the two major options (direct storage or partitioning and transmutation);

Nuclear Safety, in implementing research on existing as well as on new fuel cycles and on reactor safety of both Western and Russian reactor types as well as on new reactor design. In addition the JRC will contribute and co-ordinate the European contribution to the Generation IV International Forum R&D initiative, in which the best research organisations in the world are involved;

Nuclear Security, in supporting the accomplishment of Community commitments, in particular the control of the fuel cycle facilities emphasising the back-end of the fuel cycle, the monitoring of the radioactivity in the environment, or the implementation of the additional protocol and the integrated safeguards, and the prevention of the diversion of nuclear and radioactive material associated with illicit trafficking of such material.

ANNEX II : FUNDING SCHEMES

Subject to the rules for participation established for the implementation of the seventh Framework Programme, the EU will support research and technological development activities, including demonstration activities in the specific programmes through a range of funding schemes. These schemes will be used, either alone or in combination, to fund different categories of actions implemented throughout the Framework Programme.

1. FUNDING SCHEMES IN FUSION ENERGY

In the field of fusion energy research, the particular nature of the activities in the area necessitates the implementation of specific arrangements. Financial support will be given to activities carried out on the basis of procedures set out in:

1.1. The Contracts of Association, between the Commission and Member States or fully Associated Third States or entities within Member States or fully Associated Third States which provide for the execution of part of the EU fusion energy research programme according to Article 10 of the Treaty;

1.2. The European Fusion Development Agreement (EFDA), a multilateral agreement concluded between the Commission and organisations in, or acting for, Member States and Associated States providing *inter alia* the framework for further research on fusion technology in associated organisations and in industry, use of the JET facilities and the European contribution to international cooperation;

1.3. The European Joint Undertaking for ITER, based on the provisions of Article 45-51, Chapter 5, Title II of the Treaty;

1.4. International agreements between Euratom and third countries covering activities in the field of fusion energy research and development, in particular the ITER Agreement;

1.5. Any other multilateral agreement concluded between the Community and associated organisations, in particular the Agreement on Staff Mobility;

1.6. Cost-sharing actions to promote and contribute to fusion energy research with bodies in the Member States or the States associated with the Euratom framework programme in which there is no Contract of Association.

In addition to the above activities, actions to promote and develop human resources, fellowships, integrated infrastructures initiatives as well as specific support actions may be undertaken in particular to coordinate fusion energy research, to undertake studies in support of these activities, to support publications, information exchange; and training in order to promote technology transfer.

2. FUNDING SCHEMES IN OTHER FIELDS

The activities in other fields than fusion energy by the Euratom Framework Programme will be funded through a range of funding schemes. These schemes will be used, either alone or in combination, to fund different categories of actions implemented throughout this Framework Programme.

The decisions for specific programmes, work programmes and calls for proposals will mention, as and when appropriate:

- The type(s) of scheme(s) used to fund different categories of actions;
- The categories of participants (such as research organisations, universities, industry, public authorities) which can benefit from it;
- The types of activities (research, development, demonstration, training, dissemination, transfer of knowledge and other related activities) which can be funded through each of them.

Where different funding schemes can be used, the work programmes may specify the funding scheme to be used for the topic on which proposals are invited.

The funding schemes are the following:

a) To support actions which are primarily implemented on the basis of calls for proposals:

1. Collaborative projects

Support to research projects carried out by consortia with participants from different countries, aiming at developing new knowledge, new technology, products or common resources for research. The size, scope and internal organisation of projects can vary from field to field and from topic to topic. Projects can range from small or medium-scale focused research actions to larger integrating projects which mobilise a significant volume of resources for achieving a defined objective.

2. Networks of Excellence

Support to joint research programmes implemented by a number of research organisations integrating their activities in a given field, carried out by research teams in the framework of longer term co-operation. The implementation of these joint programmes will require a formal commitment from the organisations integrating part of their resources and their activities.

3. Coordination and support actions

Support to activities aimed at coordinating or supporting research (networking, exchanges, studies, conferences, etc). These actions may also be implemented by means other than calls for proposals.

4. Actions to promote and develop human resources and mobility

Support for training and career development of researchers.

b) to support actions implemented on the basis of decisions by the Council, based on a proposal from the Commission, the Community will provide financial support to multi-financed large-scale initiatives:

– A financial contribution from the Community to the implementation of Joint Undertakings carried out on the basis of the procedures and provisions set out in articles 45 -51, Chapter 5 of Title II of the Euratom Treaty.

– A financial contribution from the Community to the development of new infrastructures of European interest.

The Community will implement the funding schemes in compliance with the provisions of the regulation adopted in the rules for participation of undertakings, research centres and universities, the relevant State aid instruments, in particular the Community framework for state aid to research and development, as well as international rules in this area. In compliance with this international framework, it will be necessary to be able to adjust the scale and form of financial participation on a case-by-case basis, in particular if funding from other public sector sources is available, including other sources of Community financing such as the European Investment Bank (EIB).

In the case of participants to an indirect action established in a region lagging in development (convergence regions and outermost regions[48]) complementary funding from the Structural Funds will be mobilised wherever possible and appropriate.

3. DIRECT ACTIONS - JOINT RESEARCH CENTRE

The Community will undertake activities implemented by the Joint Research Centre, which are referred to as direct actions.

LEGISLATIVE FINANCIAL STATEMENT

[TO BE ADDED]

[48] Convergence regions are those set out in Article 5 of the proposal for a Council Regulation laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund - COM(2004) 492. This includes "convergence" objective regions, regions eligible for funding from the Cohesion fund, and outermost regions.