**P6_TA(2006)0265**

**Seventh Framework Programme \*\*\*I**

**European Parliament legislative resolution on the 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) (COM(2005)0119 – C6-0099/2005 – 2005/0043(COD))**

**(Codecision procedure: first reading)**

*The European Parliament*,

−       having regard to the Commission proposal to the European Parliament and the Council (COM(2005)0119)[1],

−       having regard to Article 251(2) and Article 166(1) of the EC Treaty, pursuant to which the Commission submitted the proposal to Parliament (C6-0099/2005),

−       having regard to Rule 51 of its Rules of Procedure,

−       having regard to the report of the Committee on Industry, Research and Energy and the opinions of the Commitee on Budgets,of the Committee on the Environment, Public Health and Food Safety, the Committee on Transport and Tourism, the Committee on Regional Development,  the Committee on Agriculture and Rural Development, the Committee on Fisheries, the Committee on Legal Affairs and the Committee on Women's Rights and Gender Equality (A6-0202/2006),

1.      Approves the Commission proposal as amended;

2.      Calls on the Commission to refer the matter to Parliament again if it intends to amend the proposal substantially or replace it with another text;

3.      Instructs its President to forward its position to the Council and Commission.

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[1]      Not yet published in OJ.

**P6_TC1-COD(2005/0043)**

**Position of the European Parliament adopted at first reading on 15 June 2006 with a view to the adoption of Decision *No .../2006/EC* 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)**

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*,

Having regard to the opinion of the European Economic and Social Committee[1],

Having regard to the opinion of the Committee of the Regions[2],

Acting in accordance with the procedure laid down in Article 251 of the Treaty[3],

Whereas:

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[1]     *OJ C 65, 17.3.2006, p. 9.*
[2]     *OJ C 115, 16.5.2006, p. 20.*
[3]     *Position of the European Parliament of 15 June 2006.*

(1)     The Community has **set itself** the objective of **creating the knowledge society by developing the know-how and** strengthening the scientific and technological bases of the Community industry**, including service industries, with a view to assuring** a high level of competitivity. To this end, the Community **recognises the responsibility and independence of scientists in the definition of the broad lines of research at the frontiers of knowledge, and** 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**, giving priority to those areas and projects where European funding and cooperation is of particular importance and provides added value**. **Through its support for research at the frontiers of knowledge, applied research and innovation, the Community seeks to promote synergies in European research and thus provide a more stable foundation for the European Research Area. This will make a positive contribution to the social and economic progress of all the Member States**.

(2)     **To ensure wide dissemination of the knowledge generated by publicly funded research activity, researchers must be encouraged to publish their findings and to disseminate scientific results. To this end, the case of research in the field of information and communication technologies (ICT) based on 'open source' development is a model that has been successful in providing innovation and increasing collaboration.**

(3)     The central role of **research was** recognised by the *Lisbon* European Council *of 23 and 24 March 2000* which highlighted knowledge and innovation as the **key, setting a new strategic goal for the next decade: for the EU to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth and aiming at full employment with more and better jobs and greater social cohesion**.

(4)     **The seventh Framework Programme  is central to achieving this goal. The triangle of knowledge - education, research and innovation - is a principal tool for achieving it.**

*(5)*    *Similarly, the central role of knowledge and intangible goods in the production of economic, social and cultural wealth was also recognised by the Lisbon European Council. In the knowledge-based society, innovation and knowledge production, far from flowing top-down, are widely distributed throughout society and are increasingly achieved by bottom-up processes. It is an aim of the Community to mobilize and strengthen all these research and innovation capacities.*

*(6)*    In line with the Lisbon strategy, the *Barcelona* European Council *of 15 and 16 March 2002* set the target of raising *spending on* European research *and innovation* to 3% of EU GDP, two thirds of which should come from private investment.

*(7)*    *To that end, many Member States, and European industry, must step up their research efforts in order to help make the promotion of research under the seventh Framework Programme a success.*

*(8)*    *In order to more effectively attract private investment and to ensure that research and development most effectively contribute to enhancing European competitiveness, appropriate measures should be taken in the seventh Framework Programme for the protection of intellectual property rights at an early stage in the research process. This is particularly important for SMEs, which have fewer ancillary advantages in a competitive market.*

*(9)*    *The seventh Framework Programme must seek to ensure that in addition to securing a competitive edge for the European economy through increased investment in science, scientific research funded by the EU is used, where possible, for the good of the Community, in particular in areas where there the market fails to invest.*

*(10)*    *Tax incentives may be a useful tool for increasing funds for European research.*

*(11)*   ***The overriding aim of the whole seventh Framework Programme must be to contribute to the EU becoming the world's leading research area. The seventh Framework Programme must therefore be strongly focused on promoting and investing in world-class research. It is thus imperative that the implementation of the specific programmes is based upon principles of scientific excellence rather than other priorities. Only by creating opportunities for state-of-the-art research is it possible for the EU to become the world's leading research area.***

*(12)*   The European Parliament has repeatedly stressed the importance of research, technological development and the increased role of knowledge for economic growth ***and social and environmental well-being***, *in particular in its resolution of 10 March 2005 on science and technology* - Guidelines for future *European Union* policy to support *research*[1].

*(13)*   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*; When putting forward its proposals for revision of the financial framework by 2011 (as provided for in the Interinstitutional agreement of 17 May 2006 between the European Parliament, the Council and the Commission on budgetary discipline and sound financial management[2]), the Commission should give particular priority, both in terms of income and expenditure, to the Lisbon goals and this should be reflected in additional funding for the seventh Framework Programme*.

*(14)*   ***Particularly relevant for industrial research are the European Technology Platforms and the Joint Technological Initiatives. European Technology Platforms can evolve to represent a general tool for fostering European competitiveness.***

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[1]   *OJ C 320 E, 15.12.2005, p. 259.*

**[2]   *OJ C 139, 14.6.2006, p. 1.***

*(15)*    *In line with* these objectives, *the seventh Framework Programme* 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 ***which will meet the goals of the Lisbon strategy in all Community sectoral policies***. Among these objectives the following are particularly important:

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

*(17)*    The dynamism, creativity and excellence of European research at the frontier of knowledge should be enhanced. ***In view of this, financing more speculative basic research should be a clear priority of the seventh Framework Programme.***

*(18)*    The human potential in research and technology in Europe should be strengthened quantitatively and qualitatively***; better education and easier access to research opportunities are the principal tools for achieving this goal***, ***not least through a significant increase in the presence of women in research, and by encouraging researcher mobility. To that end, Member States should be called upon to enforce the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers, both of which are necessary in order to establish a genuine European area for researchers***.

*(19)*    ***The dialogue between science and society in Europe should be deepened in order to develop a science and research agenda that meets citizens' concerns, including by fostering critical reflection, and is aimed at restoring public confidence in science.***

*(20)*    ***Special attention should be paid to facilitating the scientific career of junior and early-stage researchers, in the most productive period of life, to allow them to play a significant role in all seventh Framework Programme activities. Early -stage and early-career researchers should become a major driving force of science in Europe. Concrete measures should be undertaken in this regard in all activities under the specific "Cooperation", "Ideas" and "People" programmes.***

*(21)*    **The innovative character of the seventh Framework Programme lies in the concept of European research 'at the frontiers of knowledge' and the fact that, in this context, excellence is to be the guiding criterion; the human potential on which the Union can draw should be put to the best possible use.**

*(22)*    *Research*, innovation **and technology transfer** capacities throughout Europe should be enhanced and their optimal use should be ensured **by adopting an "Open Innovation" approach in order to support the emergence of world-leading research in Europe. To that end, a debate might be held on the exemption from company tax of Community financial support awarded to SMEs under the seventh Framework Programme**.

*(23)*    **The translation of results from excellent research into products, processes and services must be stimulated.**

*(24)*    **The scientific excellence of project proposals should be the decisive criterion for the award of Community financial support.**

*(25)*    **Taking note of the Protocol on Protection and Welfare of Animals annexed to the Treaty, research for the development of alternative testing strategies and, in particular, non-animal methods in all research areas should be promoted and enhanced in order to reduce the use of animals in research and testing, with a view to ultimately replacing animal use.**

*(26)*    In order to realise *those* 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").

*(27)* Under "Cooperation", support should be provided to trans-national co-operation at ***appropriate*** scale across the *EU* 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*, **public health*** and industrial challenges*, **serve the public good and assist developing countries. Where possible, this programme will allow flexibility for mission-orientated schemes which cut across the thematic priorities. To ensure that SMEs interests are adequately taken into account in the decision-making procedures of European Technology Platforms, they should be represented in such fora by both national and international representatives. The programme should also ensure that the EU is able to maintain its leading position in sociological and humanities-based research into the interaction between people and new technology, and into the significance of technology for the development of society as a whole***.

*(28)* Under "Ideas", activities should be implemented by a European Research Council *(ERC)*, which should enjoy a high degree of autonomy. ***It is essential to develop very high-level frontier research at European level, building on excellence in Europe and raising its profile above that of the activities carried out in the Member States. After an initial phase, the ERC will have regular contact with the European Institutions and the scientific community in order to agree an organisational method by which to support the work of the ERC and promote its interests in the public sphere.***

*(29)*   Under "People", ***more gifted*** individuals should be ***encouraged*** to ***enter the profession of researcher***, ***convergence of training methodologies and options should be promoted where researchers are concerned, extending also to the skills that they acquire; it should be ensured that*** European researchers stay in ***or return to*** Europe***; it should be made easier for researchers to move from public to private research institutions and vice versa; and efforts should be made to attract*** researchers from ***all over the world to*** Europe***. To that end, efforts should be made to improve the mutual recognition of diplomas and professional qualifications acquired on the territory of the Community and in third countries. The successful Marie Curie Programme, which has been welcomed by applicants, should be continued with the existing instruments. The mobility of researchers in Europe should be given priority in order to secure the diffuse dissemination of knowledge and to ensure that innovative frontier research in various disciplines benefits from dedicated and competent researchers, as well as increased financial resources***.

*(30)*   ***Furthermore, the "People" programme should serve to raise the quality and the scale of the human potential for research and technology in Europe, not least by recognising the "profession" of researcher. This would enable excellence to be maintained in basic research, promote even development of technological research, and greatly encourage researcher mobility towards and away from Europe.***

*(31)*   ***In addition, under "People", children's curiosity and interest in science should be fostered within an environment which triggers such curiosity in children and young people, by reinforcing science education at all levels, including in schools, and promoting interest and participation in science among young people.***

*(32)*    Under "Capacities", the use and development of research infrastructures should be optimised; ***procedures for access to the seventh Framework Programme should be simplified; the dissemination of information on the actions being carried out under the seventh Framework Programme should be promoted;*** innovative capacities of SMEs and their ability to benefit from research should be strengthened; the development of regional research-driven clusters ***with the potential to be world leaders*** 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 ***through the integration of research and dissemination***, and horizontal actions and measures in support of international co-operation should be undertaken.

*(33)*    The Joint Research Centre ***(JRC) has the crucial role of*** providing customer-driven ***scientific and technological*** support for the ***conception, development,*** implementation ***and monitoring*** of EU policies. ***Continuous support should be given to the JRC to allow it to function as a reference centre of science and technology for the EU, independent of private and national interests. Efforts should be undertaken to make the JRC an independent body by which the Community can assess risks to citizens, especially as regards environmental risks and food safety, and conduct energy impact assessments.***

*(34)*    ***The Commission has recognised on numerous occasions that the regions have an important part to play in implementing the European Research Area, for example in its Communication on the Regional Dimension of the European Research Area.***

*(35)* The seventh Framework Programme complements the activities carried out in the Member States*,* as well as other Community actions that are necessary *to* the overall strategic effort *to achieve* the Lisbon *objectives, in* particular, those *under the* Structural *Funds, and those relating to* agriculture, education, training, competitiveness and innovation, industry, employment and environment ***and rules on intellectual property rights. Accordingly, alongside support for research projects, which form the core of the seventh Framework Programme, it is vital that it should support the coordination of national and regional research policies and programmes. The important contribution of local authorities to the research funding effort should be stressed, and the seventh Framework Programme should make it possible to enhance the synergies between regional policies and Community actions. The Commission Directorate General for Research is responsible for ensuring that complementarity and synergy exist between the various Community funding programmes, including the Structural Funds, the European Development Fund and the Competitiveness and Innovation Framework Programme***. *In particular, the seventh Framework Programme must profit, through the Member States' funding schemes in the newly proposed innovation-driven Structural Funds, from an increased complementarity with the Structural Funds.*

*(36)* ***The seventh Framework Programme should aim, in particular, to secure the appropriate involvement of SMEs in all of its activities and programmes.*** Innovation and SME-related activities supported under *the seventh* Framework Programme should be ***such as to achieve the greatest possible synergies with, and the closest possible*** complementary ***relationship*** to*,* those undertaken under the *Competitiveness and Innovation Framework Programme* ***and other Community programmes and measures***. ***Such synergies will address the need for a strengthened and simplified approach to research funding, which is particularly important for SMEs.***

*(37)* ***To that end, intellectual property should be protected more securely, and action intensified at European level to combat pirating and counterfeiting, which severely impede the innovation capacities of European SMEs***.

*(38)*     ***Protection of intellectual property is essential factor in the development of the European Research Area. The European Patent Office should be reformed in its legal basis to reflect the change in the European Institutions, and its procedures should be simplified by a move towards a single European patent and in close adherence to the principle that rights to sole exploitation of an invention are granted only in exchange for, and to the extent that there has been, full disclosure. The participation of the private sector and the commercial exploitation of the results of scientific and technical research and innovation should be encouraged but a balance between intellectual property rights and dissemination of knowledge should be found.***

*(39)*     ***New specific research programs for the benefit of SMEs should be identified.***

*(40)*     ***The participation of the business sector and the commercial exploitation of scientific knowledge and technical skills are important factors in ensuring that the seventh Framework Programme does in fact make a contribution to achieving the Lisbon goals, in particular increased growth and the creation of jobs.***

*(41)*     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 ***and make full use of its researchers' potential without any form of discrimination***, the vital role *that* Community intervention plays in making the European research system more efficient and effective, the contribution of a larger seventh Framework Programme to ***efforts to find solutions to climate change and sustainability, improve the health of Europe's population as well as reinvigorate*** the Lisbon strategy, there is a pressing need to double the EU research budget[1].

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[1]     As already presented in the Commission Communications *of 10 February 2004* (*COM(2004)0101)* and of 14 July 2004 (*COM(2004)0487)* on the Financial Perspectives 2007-2013.

(42)    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 *established* which should allow the political objectives of EU research policy to be *achieved* 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*, and stronger management autonomy should be granted to participants*. *These simpler "funding schemes" should include rules (such as minimum rates for certain cost items) which are appropriate to decreasing possible imbalances. Participants in the seventh Framework Programme should be granted a say in the choice of instruments and a greater degree of administrative autonomy*.

(43)    *Taking into account the administrative requirements for participation in the seventh Framework Programme, short time to decision, short time to contract, short time to payment, transparency, operational efficiency and clarity with regard to legal rules and the Community's financial commitments are essential matters for participants.*

(44)    *Community competences with regard to research and technological development are laid down in Articles 163 to 173 of the Treaty. Those provisions provide, inter alia, that the Community is to complement the activities carried out in the Member States with a view to achieving the objective of strengthening the scientific and technological bases of Community industry, encouraging it to become more competitive at international level and promoting research activities.*

(45)    *The Community's competences with regard to research thus complement those of the Member States and the Community should make use of those complementary competences essentially through initiatives to provide financial support and/or non-binding coordination or to support and complement national policies. This may never, even indirectly, equate to the harmonisation of national provisions.*

(46) 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.

(47) 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 reaping the full benefits of internationalisation of research and development, to contributing to the production of global public goods and* to further integrating the Community into the world-wide research community.

(48) *There is already a significant body of scientific knowledge capable of drastically improving the lives of those who live in developing countries; where possible, the seventh Framework Programme will contribute to meeting the Millennium Development Goals by 2015.*

(49) *The participation of the less developed EU regions and the wider dissemination of the results of research and technological development are of vital importance for European competitiveness, bridging the technological divide and improving social cohesion.*

(50) The seventh Framework Programme should contribute towards promoting *growth,* sustainable development and environmental protection*, and, specifically, to addressing climate change and the ensuing increasing severity of extreme climatic events*.

(51)     Research activities supported by *the seventh* 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 *continue to* be taken into account. ***Research activities aimed at human cloning, heritable modifications of the human genome, or production of human embryos solely for stem cell procurement should not be supported under the seventh Framework Programme. Research on the use of human stem cells may be financed under the seventh Framework Programme, depending both on the contents of the scientific proposal and the legal framework of the Member State(s) involved.***

(52)     Under the seventh Framework ***Programme the*** role of women in science and research ***will be actively promoted by appropriate measures*** with a view to ***encouraging greater numbers of women to become involved in this working environment, not least by taking the steps required to facilitate the reconciliation of work and family life, and, where possible, ensuring  the provision of childcare facilities in accordance with the Presidency conclusions of the Barcelona European Council. Furthermore, an appropriate choice of research topics should contribute to achieving full equality for women in all areas of social and working life***.

(53)     ***Calls for proposals under the seventh Framework Programme may be published as early as the year preceding the decision on the call, subject to the availability of funds in the following year. Irrespective of the date of publication of the call for proposals and notwithstanding Article 115 of Council Regulation (EC, Euratom) No 1605/2002 of 25 June 2002 on the Financial Regulation applicable to the general budget of the European Communities[1], calls for proposals should publish all the criteria applicable to the award of support (particularly the criteria for exclusion under Articles 93 and 94 of that Regulation), which may include references to standards. The applicable criteria in the version in force at the date of publication of the call for proposals should be binding for the duration of the award procedure.***

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[1]     *OJ L 248, 16.9.2002, p. 1.*

*(54)* Appropriate measures **- *proportionate to the Community's financial interests at stake and with a minimum of bureaucracy -*** should also be taken ***to monitor both the effectiveness of the financial support granted and the effectiveness of the utilisation of these funds** in order* 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[1], *(Euratom, EC)* 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[2] and Regulation (EC) No 1073/1999 of the European Parliament and of the Council *of 25 May 1999* concerning investigations conducted by the European Anti-Fraud Office (OLAF)[3].

*(55)* 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, ***while also ensuring legal certainty and the accessibility of the programme to*** all participants. It is necessary to ensure compliance *with Regulation* (EC, *Euratom*) *No 1605/2002 and* with the requirements of simplification and better regulation. ***The simplification of procedures used to execute the seventh Framework Programme will help to ensure the flexibility of the implementing measures included in Regulation (EC) No [.../...] of the European Parliament and of the Council of [...] laying down rules for the participation of undertakings, research centres, and universities in actions under the Seventh Framework Programme and for the dissemination of results (2007-2013)[4]("the Rules for Participation").***

*(56)* ***For reasons of practical expediency and consistency with the preceding recital, the Rules for Participation fully reflect the spirit of simplification in which this Decision has been drafted. Simplification is essential in order to ensure a right of access to the seventh Framework Programme to all interested parties.***

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[1]     OJ L 312, 23.12.1995, p. 1.
[2]     OJ L 292, 15.11.1996, p. 2.
[3]     OJ L 136, 31.5.1999, p. 1.
[4]     ***OJ L ...***

*(57)    Bodies awarding financial aid should cooperate in creating a joint body with the task of providing information and advice to applicants. In particular, this body should set common standards for application forms for similar types of funding, monitor the length and readability of application forms, provide information to potential applicants (especially by way of seminars and the production of manuals) and maintain a data bank for the notification of applicants by the Commission.*

*(58)    The award procedure should, in principle, be divided into several procedural steps, the first confining itself to a rough assessment of the admissible applications submitted. Where it is already clear at this stage of the procedure that an application has no chance of success, the applicant should be notified of that fact pursuant to Article 116(3) of Regulation (EC, Euratom) No 1605/2002. Each subsequent step in the proceedings must be clearly distinct from the preceding one, particularly as regards the scope and content of the documentation that the applicant is required to submit. Where an applicant is required to submit a supporting document, this document must be required of him only once per procedure. Once gathered, data are to be stored in a database, as provided for in Article 109a of that Regulation. The aim is to achieve a speedy conclusion to the procedure. Notwithstanding the principles of Article 109(1) of that Regulation, the authorising officer must ensure throughout the procedure that the effort required of an applicant in terms of publication, documentation and other compulsory supporting material in order to obtain financial support is not disproportionate to the value of the support.*

*(59)    The roles and duties of the new executive agencies proposed by the Commission for the administration and management of mobility and SME-specific support actions are clearly defined in the Rules for Participation.*

*(60)*    This act establishes a financial *envelope* for the entire duration of the programme which is to be the *prime* reference for the budgetary authority, within the meaning of *point 37* of the *Interinstitutional agreement of 17 May 2006, during the budgetary procedure.*

*(61)*    Since the objective of the actions to be taken in accordance with Article 163 of the Treaty, *namely* 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, **in close partnership with the European regions,** 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 Decision* does not go beyond what is necessary in order to achieve *that objective*.

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 "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)     Fisheries and sustainable exploitation of the oceans;*

   *(d)*     Information and Communication Technologies;

   *(e)*     Nanosciences, Nanotechnologies, Materials and new Production Technologies;

   *(f)*     Energy;

   *(g)*     Environment (including Climate Change);

   *(h)*     Transport (including Aeronautics);

   *(i)*     Socio-economic Sciences and Humanities;

   *(j)     Security;*

   *(k)     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*, technological development and entrepreneurship* in Europe *and supporting the increased mobility of researchers 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

*Specific programmes*

The seventh Framework Programme shall be implemented through specific programmes. These programmes shall establish precise objectives and the detailed rules for implementation ***in accordance with Regulation (EC, Euratom) No 1605/2002***.


Article 4

**Maximum overall amount and shares assigned to each programme**

1.     The maximum ***indicative*** overall amount for Community financial participation in *the* seventh Framework Programme shall be ***EUR 50 524 million for the period of 7 years starting on 1 January 2007***. 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 | *32492* |
| Ideas | *7560* |
| People | *4777* |
| Capacities | *3944* |
| Non-nuclear actions of the Joint Research Centre | *1751* |

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 *the seventh* Framework Programme are set out in Annex III.

4. ***The above amounts shall be amended when the Financial Framework is revised as provided for in the Interinstitutional agreement of 17 May 2006.***

5. ***The Commission shall provide prior information to the budgetary authority whenever it intends to depart from the breakdown of expenditure set out in the remarks and annex to the annual general budget of the European Union.***

Article 5

**Protection of the Communities' financial interests**

For the Community actions financed under this Decision, Regulation (EC, Euratom) No 2988/95 and Regulation *(Euratom, EC)* 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 *Union* or budgets managed by them, by an unjustified item of expenditure.

Article 6

*Ethical principles*

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

*2.*     *The following fields of research shall not be financed under the seventh Framework Programme:*

–     *research activities aiming at human cloning for reproductive purposes,*

–     *research activities intended to modify the genetic heritage of human beings which could make such changes heritable,*

–     *research activities intended to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer.*

3.      *Research on the use of human stem cells, both adult and embryonic, may be financed, depending both on the contents of the scientific proposal and the legal framework of the Member state(s) involved.*

*Any such application for financing must include details of the licensing and control measures that will be taken by the competent authorities of the Member States.*

*As regards the use of human embryonic stem cells, institutions, organisations and researchers must be subject to strict licensing and control in accordance with the legal framework of the Member State(s) involved.*

4.      *A revision of the fields of research referred to above must take place in the second phase of this programme in the light of scientific advances.*


Article 7

**Monitoring, *evaluation,* assessment and review**

1.      ***The*** Commission, with the assistance of external experts,  shall ***keep this*** Framework Programme and its specific programmes ***under continuous and systematic review, and shall carry out at least two interim evaluations, one in 2009 and the other in 2011 based on empirical methodologies. Where appropriate, it shall propose modifications to the objectives and research activities in order to enhance their efficiency and effect and to take account of emerging fields of research.  New funding instruments and Rules for Participation shall also be subject to an evaluation as to their simplicity and flexibility. The results of the evaluation, including the findings on the effectiveness of new actions and structures (especially the European Research Council and Joint Technology Initiatives) as well as the results of the simplification procedures, shall be presented to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.***

*Prior to the commencement of the seventh Framework Programme, data necessary for a thorough impact assessment evaluation report will be identified, in order to ensure that consistent data methodologies are used to collate that information. The Commission shall also collate data detailing where funding under the seventh Framework Programme has been allocated across the EU.*

2.      Two years following the completion of *the seventh* 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 ,

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 *will* strengthen excellence in scientific and technological research through the following four programmes: cooperation, ideas, people and capacities.**

*The following strategic lines will be supported by the programme; the European Research Area, SME involvement, private-sector finance, policy-based research, complementarity with national policies, attracting and retaining researchers in the EU, and technology transfer.*

*Europe must aim for true excellence in research in order to become a leading player in cutting-edge research, technological development and demonstration activities.*

**I      COOPERATION**

In this part of the *seventh* Framework Programme, support will be provided to trans-national co-operation at every scale across the *EU* and beyond, in a number of thematic areas corresponding to major fields of the progress of knowledge and technology, where **the highest quality** research must be supported and strengthened to address European social, economic, environmental and industrial challenges**, and fields of research that have been neglected over the years, with particular reference to the medical needs of developing countries**.

The overarching aim is to contribute to sustainable development.

The *eleven* themes determined for EU action are the following:

(1)  Health;

(2)  Food, Agriculture and Biotechnology;

*(3)*  ***Fisheries and sustainable exploitation of the oceans;***

*(4)*  Information and Communication Technologies;

*(5)*  Nanosciences, Nanotechnologies, Materials and new Production Technologies;

*(6)*  Energy;

*(7)*  Environment (including Climate Change);

*(8)*  Transport (including Aeronautics);

*(9)*  Socio-economic Sciences and the Humanities;

*(10)*  ***Security;***

*(11)*  ***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 *seventh* 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 *in* these *areas*.

Special attention will be paid to **the effectiveness of coordination between thematic areas and** scientific areas which cut across themes. ***Thus, joint calls for proposals will be organised, stressing in particular inter- and multi-disciplinary aspects, in those thematic priorities which clearly imply the interrelation of various disciplines such as social sciences and natural sciences. To that end, calls will include criteria to assess the level of interdisciplinarity.***

***The involvement of SMEs, in particular knowledge-based SMEs, must be secured by means of practical support measures accompanied by quantitative and qualitative monitoring of the results achieved.***

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

In the case of *areas* of industrial relevance in particular, the topics have been identified relying, among other sources, on the work of *various European* Technology *Platforms set* up in fields where Europe's competitiveness, economic growth and welfare depend on *significant* research and technological progress in the medium to long **term.**

The ***eleven themes*** also *cover the* research needed to underpin the formulation, implementation and assessment of EU ***policies, along*** with pre-normative and co-normative research ***and independent expertise*** relevant to improving ***interoperability and competition by improving*** the quality of standards and their implementation.

Under each theme, *in addition to* these activities, *it will be possible* to address two types of opportunities and needs in an open and flexible way:

- *Future and* **emerging** *technologies*: *there is a need to encourage research aiming at identifying or further exploring, in a given field and/or in combination with other relevant areas and disciplines, new scientific and technological opportunities,* through specific support for spontaneous research proposals*, including joint calls; there is also a need to cultivate original ideas and radically new uses and to explore new options in the form of road maps*, in particular *when* linked with a potential for significant breakthroughs*; adequate coordination with activities pursued under the "Ideas" programme will be needed in order to prevent any overlap and permit optimum use of funds*;

- **Unforeseen policy needs:** to respond in a flexible way to new policy needs that arise during the course of the *seventh* Framework Programme, such as unforeseen developments or events requiring a quick reaction, *for example* 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, 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 *Framework* 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*, gender aspects **and the involvement of early-stage researchers** will be taken into account.

*The Community will support technology transfer activities and contribute to bridging the gap between research and its commercialisation by providing finance to the European Investment Fund  to manage a Technology Transfer Facility. Subject to conditions to be specified in the specific programmes and in the Rules for Participation, the facility will finance technology transfer activities of universities, research centres and other legal entities active in the field of technology transfer.*

*The wide variety of activities funded under the seventh Framework Programme makes the proper integration and coordination of activities necessary. To avoid fragmentation and overlapping competencies, there should be more cooperation between national and European research programmes, and between economic actors in the long-term research agenda.*

*Particular attention will be paid to ensuring the adequate participation of SMEs, in particular knowledge-intensive SMEs, in transnational cooperation. Therefore, concrete measures, including special calls for SMEs, "National Exploratory Awards", and support actions to facilitate SME participation will be implemented throughout the "Cooperation" programme. In addition, the aim will be to allocate at least 15% of the "Cooperation" programme budget to SMEs. In order to meet this target, the participation of SMEs will be facilitated through strategic projects or clusters in connection with priority themes or European Technology Platform projects.*

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

- *European Technology Platforms;*

- Collaborative research;

- Joint Technology Initiatives;

- Co-ordination of research programmes;

- International Co-operation.

*Raising the competitiveness of European research requires that the potential across the whole European Research Area is fully unlocked. Therefore, projects aiming at scientific excellence, while fostering a true European Research Area through the formation of broad-based consortia, will explore possibilities for optimal use of human and financial resources.*

*European Technology Platforms*

*European Technology Platforms are mechanisms to bring together all interested stakeholders in order to develop their respective Strategic Research Agendas and follow them up with concrete distribution of tasks among themselves.*

*European Technology Platforms will facilitate the participation of single enterprises (especially SMEs) or groups of enterprises in research projects relating to their specific fields of competence.*

*In order to fully exploit their competitiveness potential, regional research-driven clusters will, have the possibility of joining European Technology Platforms.*

*Financial institutions should be encouraged to mobilise capital to facilitate loans for projects implementing Strategic Research Agendas, using all financing options, including the Risk Sharing Finance Facility, which is an instrument of the seventh Framework Programme.*

*European Technology Platforms should make use of the extensive experience gained by the EUREKA clusters, which have successfully contributed to the growth of Strategic Research Areas in Europe.*

**Collaborative research**

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

*To support the development of the European Research Area, existing European institutions and universities, in their capacity as fundamental centres of excellence in the area of scientific and technological research, should be supported in developing and enhancing their excellence by increasing points of contact and general coordination with other research and innovation activities at national and regional level. This will be achieved through introducing new networking and integration tasks into the remit of the Networks of Excellence.*

This **objective** will be achieved by supporting collaborative research through a range of funding schemes: **by far the largest number of projects will be** Collaborative projects **and** Networks of Excellence - Co-ordination/support actions (see Annex III). **Collaborative projects should cover research and demonstration activities, bringing results closer to the market and linking this action line with instruments offered by the Competitiveness and Innovation Framework Programme.**

## Joint Technology Initiatives

In a limited number of cases, the scope of a RTD objective and the scale of the resources involved justify setting up *long-term* public private partnerships in the form of Joint Technology Initiatives. These **new instruments should be based on the activities developed by the** European Technology Platforms and **the smooth passage from the Strategic Research Agendas must be ensured by the Commission. Clearly defined criteria and guidelines must be established for the selection of Joint Technology Initiatives. Implemented under** Article 171 of the Treaty**, such joint undertakings must combine public and private funds. The European Investment Bank (EIB) must mobilise capital to facilitate loans under the Risk Sharing Finance Facility. The Risk Sharing Finance Facility, jointly implemented by the EIB and the Commission, must be managed by an appropriate joint committee and organised as an instrument of the seventh Framework Programme. It must compile a report containing recommendations for budgetary distribution among the research, technology and development priorities in the Joint Technology Initiatives in line with the priorities set by the Barcelona European Council. The activities should also be coordinated with the European Investment Fund to provide financial resources for SMEs**.

Potential Joint Technology Initiatives will be identified *in an open and transparent way* on the basis of *an evaluation using* a series of *criteria*:

– *the existence of a genuine societal need and commitment from industry;*

– *the added* value of *EU*-level intervention *measured in terms of excellence and synergies obtained through cross-border cooperation*;

– *relevance of benefit to society;*

– *inability of existing instruments to achieve the objective;*

– *scale of the impact on industrial competitiveness and growth;*

– *capacity to encourage entrepreneurship;*

– *the* degree and clarity of definition of the objective *and deliverables* to be pursued*;*

– *the agenda for the training of researchers involved;*

– *strength* of the financial and resource commitment from *industry;*

– *importance* of the contribution to broader policy objectives*;*

– *the capacity* to attract additional national support and leverage current *and* future industry *funding*.

*The nature of the Joint Technology Initiatives must be clearly defined, in particular with regard to matters concerning:*

– *financial commitments;*

– *duration of the commitment of the participants;*

– *provisions governing entry to and exit from the contract;*

– *intellectual property rights.*

***Considering the wide scope and particular complexity of the Joint Technology Initiatives, significant efforts will be made to ensure their transparent operation in line with principles of excellence.*** Particular attention will be paid to the overall coherence and coordination between Joint Technology Initiatives and national programmes and projects in the same fields. ***Their implementation procedures should include specific roadmaps for the inclusion of SMEs and technology transfer, as well as programmes for the education and training of researchers taking part. Member States and the Commission must make common efforts to establish coherent coordination actions and provide the financial backing to implement them.***

**Co-ordination of non-Community research programmes**

*Actions* 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 (Article 169 *of the Treaty*). *Actions* may cover subjects not directly linked to the *eleven* themes in *so* far as they *have sufficient* EU added value. *Actions* will also be used to enhance the complementary and synergy between the *seventh* Framework Programme and activities carried out in the framework of intergovernmental structures such as EUREKA and COST[1].

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 *mutually opening up* their programmes.

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

–   Providing additional *Community* 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)*.

–   ***Applying, in a limited number of areas, the successful ERA-STAR model of cooperation between European regions and small or medium-sized Member States to the governance of long-term programmes such as Global Monitoring for Environment and Security (GMES).***

The participation of the Community in national research programmes jointly implemented on the basis of Article 169 *of the Treaty* is especially relevant to European co-operation on a large scale in *terms of* "variable geometry" between Member States sharing common needs and/or interests. Such Article 169 initiatives will be launched in areas to be identified in close association with the Member States, *including possible* cooperation with intergovernmental programmes ***such as EUREKA***, 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 *the seventh* Framework Programme*;*

–   *the presence* of a pre-existing basis (*existing* or envisaged *national research programmes);*

–   European added value*;*

–   ***social and environmental added value;***

–   *critical* mass, with regard to the size and the number of programmes involved *and* the similarity of activities they cover*;*

–   *whether* Article 169 *of the Treaty is* the most appropriate means for achieving the objectives.

**International co-operation**

International cooperation actions *must show clearly defined European added value.* Under this part of the *seventh* Framework Programme *such actions* will be:

- *Increased participation* in the thematic areas *by* researchers and research institutions *from third* countries, *with appropriate restrictions for the Security theme in connection with issues of confidentiality*, *and* coupled with a strong effort to encourage them to seize this opportunity.

- Specific co-operation actions in each thematic area dedicated to third countries *where there is* mutual interest in co-operating on particular topics. Closely associated 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. *As well as serving fields of mutual interest,* such actions *also include*: actions aiming at reinforcing the research capacities of candidate countries as well as neighbourhood countries *and* cooperative activities targeted at developing and emerging countries, focusing on their particular needs in fields such as health, *with particular emphasis on orphan and neglected diseases,* agriculture, fisheries and environment, and implemented in financial conditions adapted to their capacities.

This part of the *seventh* Framework Programme *covers international* co-operation actions in each thematic area and across themes. *Those actions* will be implemented in coordination with those under the "People" and the "Capacities" *programmes*.

*An overall strategy for international cooperation within the seventh Framework Programme will be prepared, defining objectives, European interest and specific areas of cooperation with each group of countries. The strategy will indicate areas in which third country participation should be limited, for example, security research.*

## THEMES

## 1.      Health

### Objective

**Improving the health of European citizens, increasing the competitiveness *and boosting the innovative capacity* of European health-related industries and businesses, while addressing global health issues including emerging epidemics *and neglected diseases*. *Research will aim both at optimising the prevention of diseases and the development of effective treatments and medicines while ensuring equitable access to the results of publicly-funded research.* 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, *and research-based treatment facilities representing the newest state of the art,* 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*,* understanding underlying biological processes ***and developing key technologies for health related bio-industries*** requires *the* bringing together *of* 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 *require* multidisciplinary and pan-European approaches involving different stakeholders. Such approaches *will* 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, *auto-immune and infectious diseases, allergic diseases, epilepsy, trauma, rheumatic diseases, respiratory system diseases,* mental and neurological diseases, in particular those linked with ageing, such as *osteoporosis,* Alzheimer and Parkinson diseases) relies on international multi-centre trials to *reach* 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 engineering approaches for biologicals and cells, and* new diagnostics and treatments for rare disorders also *requires* multi-country approaches to increase the number of patients for each *study. 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.

*Strong* EU-based biomedical research will help strengthen the competitiveness of the European healthcare*,* biotechnology, medical technology and pharmaceutical industries. *EU collaboration with developing countries will allow those countries to develop research capacities.* The EU *must also play* an active role in creating an environment conducive to innovation in the *public and* pharmaceutical *sectors which address public health needs*, in particular to maximise the success of clinical research. *To this end, the implementation of the Medicines Investigation for the Children of Europe (MICE) Programme will be promoted. Major EU-based research into ion therapy (proton and carbon ions) will open up and further improve already successful methods of cancer treatment and strengthen the competitivity of plant engineering and the construction (accelerator technology) and medical technology industries. In this field the success of clinical research should also be maximised. European research and innovation in the field of alternative testing strategies, in particular non-animal methods, will ensure global leadership in addressing public and stakeholder concerns about the continuing use of animals in biomedical research and could, in addition, provide a market for certain sectors of industry.*

Research-based SMEs are the main economic drivers of the healthcare biotechnology and medical technology industries. Although Europe now has more *biotechnology* companies than *the* 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 *legal* 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 **and themes**. ***In other respects, research on health will be prioritised around (a) present and future projections of disease burden in a European and global context and (b) scientific quality***. Research agendas established by European Technology Platforms, such as the **ones** on innovative medicines **and nano-medicine**, 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**, *ageing*** and *occupational* health and safety.

**Activities**

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

- *High-throughput research.* To catalyse experimental progress in **genome, post-genome and** biomedical research by **developing new model-cell engineering methods,** enhancing data generation, standardisation, acquisition and analysis **including research into DNA reading, bio-informatics and super computing for structural modelling**.

- *Detection, diagnosis and monitoring.* With emphasis on non-invasive or minimally invasive approaches **and technologies such as DNA chips and molecular imaging and diagnostics. Priority should be given to diagnostic tools that are directly linked to therapy**.

– *Predicting suitability, safety and efficacy of therapies.* To ***identify and develop biological*** markers ***so as to quantify and validate them. To improve the availability of therapeutic agents. To develop and validate*** in vivo and in vitro methods and models, including simulation, pharmacogenomics, ***immuno-monitoring,*** targeting approaches and ***other*** alternatives to animal testing***, in particular to replace the use of non-human primates; infertility research***.

– *Innovative therapeutic approaches and intervention.* To ***research,*** consolidate and ensure further developments in advanced therapies and technologies***, including immunotherapy, new vaccines and methods of producing them, innovative medicines and electronic implants,*** with potential application in many diseases and disorders ***(including those affecting children) as well as new therapeutic tools for regenerative and cell-based medicine, gene therapies, cellular therapies, immunotherapy and biomaterials, and protection and regeneration of damaged tissue by means of somatic stem cell therapies***.

– ***Bioproduction, including vectorisation: To optimise new molecule production processes.***

• **Translating research for human health**

– *Integrating biological data and processes **and modelling of complex systems**: large-scale data gathering, systems biology **and physiology, engineering of cellular and biological models**.* To generate and analyse the vast amount of data needed to understand better the complex regulatory networks of thousands of genes***, their mutations*** and gene-products ***and cell systems*** controlling important biological processes ***(i.e. synaptic and cellular reorganisation)***. ***The focus will be on genomics, the RNA world, proteomics, population genetics, comparative and functional genomics***.

– *Research on the brain and related diseases, human development and ageing**, focusing in particular on progressive degenerative diseases and the different forms of epilepsy***. To explore the process of healthy ageing ***and improve the quality of life of elderly people***.

– ***Human ethology. To study man and the urban, natural and cultural environment.***

– *Translational research in infectious diseases **and pathogen-host interactions***. To address anti-microbial drug resistance, the global threats of HIV/AIDS, ***including research into microbiocides*** malaria*,* tuberculosis ***fungal infections, and hepatitis,*** as well as emerging epidemics (e.g. SARS and highly pathogenic influenza ***or arboviral diseases***) ***as well as other potentially serious infectious diseases***.

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

– ***Translational research into occupational diseases and into diseases caused by environmental and work-related stress factors (such as asthma and allergies). To produce and analyse data on these diseases and on accidents at work, and to develop strategies for prevention, diagnosis and treatment (e.g. for musculo-skeletal disorders).***

– ***Translational research into the health of users of passenger transport systems and nearby residents. To study the long-term and large-scale effects.***

– ***Palliative medicine: pain therapy and symptomatic therapy for diseases which are not yet curable, in order to combat the patient's symptoms as effectively as possible.***

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

– *Translating clinical outcome into clinical practice.* ***To study advanced computer-aided detection, clinical decision support systems and other IT tools to improve workflow, enhance quality of diagnosis and treatment, reduce medical error and lower costs, as well as*** to understand clinical decision-making and how to translate outcomes of clinical research into clinical practice and especially addressing the specificities of children, women***, the*** elderly population ***and disabled persons. To develop telemedical applications for geographically isolated populations of the EU, especially in island and mountainous region***.

– *Quality, efficiency and solidarity of health systems including transitional health systems.* To translate effective interventions into management decisions, ***to 're-engineer' diagnostic and therapeutic processes,*** to ensure an adequate supply of human resources, to analyse factors influencing equity of access to *high-quality* health care ***(also by disadvantaged groups)***, including analyses of changes in ***the*** population (e.g. ageing, mobility and migration, and the changing workplace) ***and complications during hospital treatment***.

– *Enhanced disease prevention and better use of medicines.* To develop efficient public health interventions addressing wider determinants of health. ***To study environmental health by analysis of three factors: syndromes and chronic exposure; interaction with toxic substances and mixtures of such substances; analysis of genetic polymorphisms and immunology tests, including tests for lymphocyte transformation and activation. To conduct immunological, toxicological and epidemiological studies.*** 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.

– ***Use of scientifically tested complementary and alternative medicines. To identify successful interventions in complementary and alternative medicine to improve the health of European citizens.***

– ***Appropriate use of new technologies. To provide capacity for fast development and rapid production of medical countermeasures to biological threats and emerging diseases.***

– ***Transnational research on occupational diseases and industrial accidents. To generate and analyse the data relating to occupational diseases and industrial accidents, to develop prevention, diagnostic and treatment strategies (e.g. in relation to musculoskeletal disorders).***

– ***Sustainable optimization of industrial processes and active ingredients.***

## 2.     Food, Agriculture and Biotechnology

**Objective**

**Building a European** *knowledge-based bio-economy*[1] **by bringing together science, industry and other stakeholders,** *to support the Union's policies and* **to exploit new and emerging research opportunities that address social,** *environmental* **and economic challenges: the growing demand for safer, healthier and higher quality food and for sustainable use,** *engineering* **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 fisheries, aquacultural, agricultural, and stockbreeding* **production,** *including those* **resulting in particular from climate change; and the increasing demand for high quality food, taking into account animal welfare and rural** *and coastal* **contexts** *and ways of meeting specific consumer needs. Research will aim to integrate the diversity of scientific knowledge in order to develop balanced, sustainable and socially acceptable solutions and approaches. The awareness of citizens will be pursued in order to improve their ability to make informed choices***.**

**Rationale**

Innovations and advancement of knowledge in the sustainable management, *engineering,* 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[2], this will help ***develop new activities and*** increase the competitiveness of European ***agriculture and*** biotechnology*, **seed*** and food companies, in particular *high-tech* SMEs, while improving social welfare and well-being. ***A high level of SME participation in research is to be particularly encouraged.*** Research into ***nutritional physiology for healthy living,*** 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.

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[1]     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.

[2]     "Life Sciences and biotechnology – A strategy for Europe" - COM(2002)0027.

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 *Community* legislation.

Several European Technology Platforms contribute *to* 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. *Research in this area* will also provide the knowledge base needed to support[1]: 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*, safe seafood products and environmental remediation*. 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, *rational reverse genomics,* systems biology*, bioinformatics* and converging technologies for micro-organisms *(particularly the study of metagenomics)*, plants and animals, including *genomic engineering, conservation and sustainable use* of their biodiversity; *soil fertility;* improved crops, *plant breeding, plant health, technological alternatives to plant random transgenesis* and *improved* production systems *in all their diversity*, including organic farming, *rational and conservation farming,* quality production schemes and GMO impacts; *evaluation and marketing of plant innovations (varieties, seeds);* sustainable, competitive and multifunctional agriculture, and forestry; *integrated* rural development*, including civil society participation in planning and decision making, rational management of water use*; animal *health and* welfare, breeding and production; *including research into vaccines and diagnostics*; *alternative testing strategies and non-animal methods,* plant health; sustainable and competitive fisheries and aquaculture; infectious diseases in animals, including *epidemiological studies,* zoonoses *and diseases linked to animal feedstuffs*; safe disposal of animal waste; conservation, 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.).

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

- **"Fork to *table, sea to plate*": Food, *including sea products*, health and well being:** Consumer, societal, *cultural,* industrial and health aspects of food and feed, including behavioural and cognitive sciences; nutrition, *diet-related* diseases and disorders, *such as* obesity *and allergies; health benefits of certain food and diets*; innovative food and feed processing technologies (including packaging); improved quality and safety, both chemical and *biological*, of food, beverage and feed; integrity*, sustainability, risk assessment* and control of the food chain; environmental impacts on and of *terrestrial and aquatic* food/feed chains; *impact on and resistance of food chain to global changes;* total food chain concept (including seafood); *development of new* traceability *methods (for both GM and non-GM organisms); consequences of animal feeds and veterinary medicine for human health*.

- **Life sciences*, biotechnology *and chemistry* for sustainable non-food products and processes:** Improved crops, feed-stocks, marine products and biomass (including marine resources) for energy, environment, and high added value products such as materials and chemicals, including *new engineering methods for bio-producer or bio-catalytic strains and organisms,* novel farming systems, bio-processes and bio-refinery concepts; bio-catalysis*, bio-degradation and bio-remediation*; forestry and *forest-based* products and processes; environmental remediation and cleaner processing. *In view of potential competition among end-uses of agricultural and wood products, particular attention will be devoted to the optimization of the system to ensure the compatibility of food, energy and raw-material production.*

*3.     Fisheries and sustainable exploitation of the oceans*

*Objectives*

*To apply new models for the management of fishery resources on the basis of scientific development; to implement fisheries-management systems on the basis of (global) ecosystems as a whole and not merely on the basis of isolated (individual) species; to enhance the reliability and quality of information stemming from data collection and fisheries control and monitoring; to support the sustainable development of aquaculture.*

*Rationale*

*It is essential to develop processes which will guarantee the improved management of fishery resources through innovative fishing systems and the improvement of existing systems, taking account of the ecological, technical, socio-economic and political aspects which such an operation involves.*

*Securing an overall improvement for the oceans and their resources will entail the application of systems for the management of fishery resources based on all the components of the ecosystem (biological, chemical and physical) considered in relation to human activities. The effects of these activities must be assessed in the context of global changes in ecosystems and in marine resources in particular.*

*Promoting multi-disciplinary research aimed at fusing oceanographical sciences, fisheries biology and social sciences will require the integration of economic information in combination with databases of information relating to the management of stocks.*

*It is essential to integrate new fishing vessel monitoring in order to preserve the oceans, reduce costs and speed up access to the resulting information.*

*With regard to aquaculture, scientific support must urgently be made available in order to increase the use of more ecological production systems, produce new species, make improvements in the quality of feedingstuffs and conduct studies into the impact of possible genetic manipulation on productivity.*

*Activities*

- *Management mechanisms based on a range of information, including total allowable catches (TACs), fishing effort, technical measures and institutional adjustments*

- *Assessing the importance of fishing technologies, selectivity, and social and economic impact on management and decision-making processes*

- *Quantifying uncertainties in the assessment of stocks and fisheries*

- *Improving knowledge of deep-sea fisheries*

- *Determining the optimum state of the resource for each level of exploitation*

- *Improving knowledge of food-chain processes, with particular attention to changes in the productivity of marine systems and the transfer of pollutants through food chains*

- *Developing and applying bio-economic models with a view to assessing the consequences of management measures geared to the long-term sustainable exploitation of fisheries*

- *Strengthening coordination in the collection of data relating to fisheries and the environment in programmes geared to monitoring, creating and maintaining databases*

- *Monitoring the quality and safety of fish products with a view to maintaining a positive image of these products*

- *Improving production technologies in aquaculture (e.g. reducing the use of antibiotics, use of integrated systems)*

- *Improving knowledge in the areas of genetics, nutrition, physiology and interactions with the environment in relation to aquaculture production*

- *Identifying processes linked to the accumulation of potentially toxic compounds (toxins, metals, persistent organic pollutants) and disintoxication processes (toxic algae in bivalves)*

- *Other related activities.*

*4*.      **Information and Communication Technologies**

**Objective**

**To enable Europe to master and shape the future developments** *in* **Information and Communication Technologies (ICT) so that the demands of its society and economy are met** *and the competitiveness of European industry is improved*. **Activities will strengthen Europe's scientific and technology base** *and ensure its global leadership* **in ICT, help drive and stimulate** *product and process* **innovation** *and creativity* **through ICT use and ensure that ICT progress is rapidly transformed into benefits for** *Europe's businesses*, *for its* **industry** *and, in the final analysis, for all citizens, especially those at risk of social exclusion such as people with disabilities, older people, and those with particular difficulties as regards access to ICT*. *The priority will be considered to lie in reducing the digital divide. ICT will be the core of the knowledge-based society*.

**Rationale**

*ICT is* 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 will promote the accessibility and transparency of governance and policy development processes.*** ICT is essential *for meeting* the rise in demand for health and social care**, *accounted for primarily by older people and people suffering from some form of disability,*** and *modernising* services in domains of public interest such as education, *training*, security, energy, transport and the ***environment. ICT plays an important role in research, technology and development management and communication and*** 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*, as well as to develop innovative high-value ICT-based products and services,* set a growing agenda for research. To bring technology closer to people and organisational needs means: hiding technology complexity and **making technology functional**; making technology very simple to use, available and affordable; *and* providing new ICT-based applications, solutions and services that are trusted, reliable, and adaptable to the users' context and preferences. ***Current ICT research focuses on*** miniaturisation, ***mastering*** convergence of computing, communications and media technologies, ***including system interoperability, and*** convergence with other relevant sciences and disciplines, and ***on building*** systems that are able to learn and evolve. From these diverse efforts a new wave of technologies is emerging. ICT research activities will also ***contribute to*** a broader range of scientific and technological disciplines including ***biology, chemistry*** and life sciences, psychology, pedagogy, cognitive and social sciences***, and the humanities***. ***ICT does not simply produce new technologies. ICT is directly involved in development. The service sector, which is experiencing strong growth, still possesses considerable potential through a greater focus on the interconnection between service provision and ICT***.

***ICT research activity based on the 'open source' development model is proving its utility as a source of innovation and increasing collaboration. It is worthwhile exploring whether this model for cooperation and innovation could also prove useful for other activities under the seventh Framework Programme.***

***ICT research should not endorse one sole business model over others. It is important that a wide choice of models remains available for commercialisation of the research output.***

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 *behind its major competitors* in *investment* in ICT research. 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, **photonics,** robotics and software, **including Free, Libre and Open Source Software,** services and Grids.

**Activities**

- **ICT Technology Pillars:**

  - **Micro-, nano- and optoelectronics***, photonics**, mathematics,* *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 *a* 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**, storage** and control:* powerful, secure and distributed computing**, storage** 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**, decision-making support** and creativity in products, services and digital media, and for natural, language-enabled and context-rich interaction and communication.

– ***The transition towards fourth generation mobile systems and beyond, and related breakthrough technologies in digital transmissions and antennas.***

– ***Optical switching and related network control capabilities.***

*New perspectives in ICT drawing on other science and technology disciplines,* including insights from physics, biotechnologies, materials- and life-sciences, ***and mathematics***, 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. ***Sustainability issues will also be addressed in this area, particularly in the field of electronics (less use of materials, energy consumption, recycling and waste, 'end of life' approaches).***

- **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 ***and cooperation***; 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 *that improve* quality, efficiency, **and social** inclusiveness**, including accessibility for people with disabilities**; user friendly applications*;* integration of new technologies and initiatives such as ambient assisted living.

> – *new business models for ICT: to conceive and define new business models for ICT by joint work with those themes where ICT will play a fundamental role in changing the approach to production and services (e.g. transport, health, energy, environment). Projects originating in this joint research should be tested in specific situations. Such joint efforts should be supported through the cross-thematic approach referred to above.*
>
> – for *health:* improving disease prevention, early diagnosis and personalisation; autonomy, safety and mobility of patients; health information space for knowledge discovery*; **knowledge management, including rationalisation of health expenditure***.
>
> – to improve *inclusion* and equal participation and prevent digital divides*:* assistive technology; design-for-all.
>
> – for *mobility:* intelligent ICT-based transportation systems*,* vehicles **and vessels** enabling people and goods to move safely, comfortably*,* efficiently **and in an environmentally-friendly way**.
>
> – in support of *the environment* and sustainable development*:* to reduce vulnerability and to mitigate the consequences of natural disasters and industrial accidents.
>
> – for *governments*, **regional and local authorities and cities**: efficiency, openness and accountability, for a world-class public administration and links to citizens and businesses, supporting democracy.

- *for security: following the guidelines indicated in the 'Security' and 'Space' themes.*

- *exploitation of works or services open to the public: design and development of study simulators for crisis situations of natural origin (natural disasters) or human origin (attacks, terrorism, etc.).*

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

- ***ICT-based systems to support transfer, and their application to cultural heritage resources.***

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

- technology-enhanced *learning: **including transfer of knowledge and experience***; adaptive and ***conceptualised*** learning solutions; active learning.

- ICT-based systems to support accessibility and use over time of digital *cultural **(and scientific)*** resources and assets, in a multilingual ***and multicultural*** environment.

– *ICT supporting businesses and industry:*

- new forms of dynamic networked co-operative *business* processes, digital eco-systems ***empowering small and medium-sized organisations and communities***; ***distributed*** *work* organisation and collaborative work environments.

> > – *Manufacturing**, including traditional industries*: 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-based improvements to industrial processes.**
>
> > – **Monitoring of business management and performance in real time through efficient and productive support for managerial decisions, and data tracing, gathering and processing.**

> – **ICT supporting the built heritage.**

> – *ICT for trust and confidence*: identity management; authentication and *authorisation*; privacy enhancing technologies; rights and asset *management **based on interoperability and open standards;*** protection **of privacy** against cyber threats***; monitoring of security and privacy critical issues***.

- **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**,** *such as quantum information technology,* and radically new uses and to explore new options in ICT research roadmaps.

*5.* **Nanosciences, Nanotechnologies, Materials and new Production Technologies**

**Objective**

*Improving* **the competitiveness of European industry and** *ensuring* **its transformation from a resource-intensive to a knowledge-intensive industry, by generating breakthrough 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. ***Particular attention will be paid to disseminating research findings so as to make them accessible to businesses, especially SMEs, and to society in general.***

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 *nano-electronics*, ***nano-medicine, photonics,*** manufacturing, ***power generation,*** steel, chemistry, ***energy, minerals,*** the transport industry, construction, industrial safety, textiles, ***ceramics,*** 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-assembling properties; nano-motors; ***nano-optics, nano-biotechnology,*** nano-machines and nano-systems; ***nano-vectors;*** methods and tools for characterisation and manipulation at nano dimensions; nano and high-precision technologies in chemistry ***for the manufacture of basic materials and components***; ***nano-medicine, such as regenerative medicine, targeted drug delivery and release, and nano-diagnostics including imaging; implications of nanosciences for life sciences; nano-sustainability and nano-reliability,*** human ***and animal*** safety ***and*** health***, the food chain*** and the environment, ***specifically in view of the possibility of a direct interaction of nano-particles with genetic materials of living cells***; metrology, ***monitoring and sensing,*** 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***, particularly composites, intelligent materials and materials with multifunctional surfaces for multiple applications***, ***as well as for the repair/retrofitting of existing ones***; 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***, metamaterials, materials inspired by the biological world (biomimicry)*** and hybrid materials, including design and control of their processing***; design or improvement of materials helping to reduce emissions during their life cycle***.

***Materials with new properties are key to the future competitiveness of European industry and the basis for technical progress in many areas such as health, electronics, energy, transportation and security. This key area with high relevance across many technologies at the core of Europe's industrial competence should be particularly strengthened***.

- **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*, (including composites and engineering of bio-producer and biocatalytic strains)*; development of new engineering concepts exploiting the convergence of technologies (eg, nano, bio, *geo,* info, *optical,* cognitive and their engineering requirements) for the next generation of high value-added products and services, and adaptation to the changing needs*; implementation of high-throughput production technologies; encouraging production technologies with lower impact on CO$_2$ emissions*.

- **Integration of technologies for industrial applications**

  – Integrating new knowledge and technologies *(e. g. mathematical approaches and tools, eco-technologies),* on *nano-materials* and production in sectoral and *cross-sectoral* applications such as: health, construction, *ceramics,* transport, energy, chemistry, *minerals,* environment, *footwear,* textiles and clothing, pulp and paper, mechanical engineering*, steel*.

*6.* **Energy**

**Objective**

**Transforming the current fossil-fuel based energy system into** *the most* **sustainable** *and energy efficient economy in the world by 2020,* **based on a diverse portfolio of energy sources and carriers**, *with particular attention being paid to less and non-CO$_2$ emitting energy sources*, **combined with enhanced energy efficiency,** *energy conservation and reduction of the greenhouse effect* **to address the pressing challenges of security of supply and climate change, whilst increasing the competitiveness of Europe's energy industries.**

*To reach those objectives, approximately two-thirds of the budget under this theme is to go towards research conducted under the three renewable energy activities and the energy efficiency and savings activity.*

**Rationale**

Energy systems are confronted with major challenges. The urgency to *identify and* develop adequate and timely solutions is justified by the alarming *scenarios* in global energy demand, *the finite nature of conventional oil and natural gas reserves and* 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. *Energy research makes an important contribution towards ensuring affordable energy costs for our citizens and industries.* Research and demonstration are needed to provide the most environmentally and cost-effective technologies*, create safer applications for nuclear energy in Europe and the rest of the world,* and *provide* measures enabling the EU to meet its targets under the Kyoto Protocol and beyond and to implement its energy policy commitments, as *set out* in the *2005 Green Paper on Energy Efficiency and in the* 2000 Green Paper on the security of energy supply[1].

Europe has developed world leadership in a number of energy *generation and energy efficiency* technologies. It is the pioneer in modern renewable energy technologies, such as *solar energy,* 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 *now facing* competition (in particular from the US and Japan). *The efforts of Europe's industrial sector in developing less polluting production techniques should therefore be encouraged by specific research projects.*

Radically transforming the energy system *into a less- or non-CO$_2$ emitting reliable, competitive and sustainable energy system* requires *new materials and* new technologies with risks that are too high *and profits* 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 *aimed at meeting* the objective are set out below. A specific activity on knowledge for energy policy making is included which may also provide support to new policy needs that emerge, for example *in relation* to the role of European energy policy in the developments of international climate change actions, and instabilities *in* or disruptions *to* energy supply and price.

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[1]     *COM(2000)0769.*

**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*; organisation of the system of production, collection and treatment of biomasses for direct hydrogen production*.

- **Renewable electricity generation**

Technologies to increase overall conversion efficiency, driving down the cost of electricity production from indigenous renewable energy sources, *including waste,* 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, *including energy crops, biomass, and waste,* aiming at the cost-effective production*, storage, distribution* and use of carbon-neutral fuels, in particular liquid biofuels for transport*, including energy crops specifically optimised by plant breeding using classic as well as biotechnological methods, and electricity generation*.

- **Renewables for heating and cooling**

Technologies *and infrastructures* 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** *and technologies of transformation for use as raw materials* **for zero emission power generation**

To drastically reduce the ***adverse*** environmental impact of fossil fuel use aiming at highly efficient power ***and/or steam*** generation plants with near zero emissions, based on CO₂ capture and storage technologies ***and technologies of transformation, in particular underground storage , and CO₂ enriched atmosphere to enhance vegetal organisms' growth***.

- **Clean coal** *and other Fossil Fuel* **technologies**

To substantially improve plant efficiency, reliability and cost through development and demonstration of clean ***energy*** conversion technologies ***based on coal and other fossil fuels, gaseous or liquid process fuels and alternative fuels, also introducing advanced chemical conversion technologies for energy, heat, chemicals and fuel production***.

- **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***, by developing energy storage options, removing obstacles*** and ***developing intelligent metering systems managed by remote.*** To remove obstacles to the large-scale deployment and effective integration of distributed and renewable energy sources. ***To develop storage options not covered under the topic 'Hydrogen and fuel cells'. Concepts and technologies to improve the efficiency and cost-benefit ratio of heating and cooling networks: to develop integrated technologies/concepts for the purposes of supply using heating and cooling networks and to promote the integration of renewable energy sources into heating and cooling networks.***

- **Energy efficiency and savings**

New concepts and technologies to improve energy efficiency, *for example in lighting,* and *to reduce further final and primary energy consumption of* buildings, *taking into account the life cycle of buildings and of building works, transport systems,* services and industry. This includes the integration of strategies and technologies for energy efficiency *(e.g. cogeneration)*, the use of new *consumption-related* and renewable energy technologies and energy demand management *measures, for example in the form of flexible electricity consumption, and energy use management measures such as individual metering systems managed remotely*.

- **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*. Development of policy tools for a significant acceleration of the implementation of new energy efficiency, demand side management and renewable energy concepts and technologies*.

- *Polygeneration*

*Development of end user-oriented integrated energy systems, highly efficient in overall terms, aimed at tapping the best available environmentally-friendly energy sources. Improvement and development of new forms of energy storage. Network connection management for the above systems in order to improve overall efficiency and the quality of service.*

*7.*     **Environment (including Climate Change)**

**Objective**

**Sustainable management of the environment and its resources through advancing our knowledge on the interactions between the *climate,* biosphere, ecosystems and human activities, *advancing our knowledge about biodiversity and its sustainable use,* and developing new technologies, tools and services, in order to address in an integrated way global environmental issues. Emphasis will be *placed* on prediction of climate, ecological, earth and ocean systems changes*,* on tools and technologies for monitoring, prevention*,* mitigation *and adaptation* of environmental pressures and risks*,* including *to* health, as well as for the conservation *and recovery* 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 *pressure* from growing population, urbanisation, continuous expansion of the agriculture, *fishery,* transport*, construction* 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 ***on the basis of environmentally-friendly quality*** 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 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 UN Framework Convention on Climate Change (UNFCCC) and its* Kyoto protocol, the UN Convention on Biological Diversity, *the UN Convention to Combat Desertification, the Stockholm Convention on Persistent Organic Pollutants,* the objectives of the World Summit on Sustainable Development 2002, including the EU Water *Initiative*, *contributions* to the Intergovernmental Panel on Climate Change and the Earth Observation initiative *and the forthcoming soil protection programme*. 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*, and actions for improving the mechanisms relating to conservation of the Natura 2000 network*.

The EU needs to strengthen its position in world markets for environmental technologies. Such technologies *contribute to sustainable consumption and production and* help deliver sustainable growth providing eco-efficient solutions to environmental problems at different scales and protecting our cultural *and natural* heritage. Environmental requirements act as a stimulus for innovation and can provide business opportunities *and higher competitiveness, while at the same time ensuring a more sustainable future for future generations*. 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[1] 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 *to* the post-Kyoto action on *climate change*; and new environmental policies such as in maritime policy, standards and regulations.

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

**Activities**

- **Climate change, pollution and risks**

  – *Pressures on environment and climate:* functioning of climate and the earth ***and marine systems, including the polar regions***; adaptation and mitigation measures; pollution ***and prevention of pollution*** in air, soil and water; changes in atmospheric composition and water cycle; ***global and regional*** interactions between ***atmosphere***, land surface and the ocean; and impacts on biodiversity and ecosystems***, including the effects of the sea level rise on valuable coastal zones and coastal cities, and impacts on particularly sensitive areas, such as coastal and mountainous regions***.

  – *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 ***engineered cells and other*** alternatives to animal testing; quantification and cost-benefit analysis of environmental health risks and indicators for prevention strategies.

  – *Natural hazards:* improve ***forecasting*** and integrated *hazard-* vulnerability - and *risk* assessments for disasters related to geological hazards (such as earthquakes, volcanoes, tsunamis) and climate (such as storms***, frosts, drought,*** floods***, conflagrations, avalanches, landslides, forest fires and other extreme phenomena***) ***as well as phenomena provoked by such disasters***; develop early warning systems and improve prevention and mitigation strategies***; analyse the handling of natural hazards and disasters***; ***draw up multirisk approaches focused on combining strategies for specific risks with comprehensible plans, procedures and protocols***.

- **Sustainable Management of Resources**

  – *Conservation and sustainable management of natural and man-made resources:* ecosystems; water resources management; waste management and prevention; protection and management of biodiversity, ***including control of invasive alien species***, soil ***remediation and*** protection, *protection of seabeds**, lagoons** and coastal *areas, approaches* against desertification and land degradation***, preservation of landscape***; forest ***and mineral*** management; sustainable management and planning of urban environment, ***historic resources, cultural heritage and tourism;*** data management and information services; assessment and foresight relating to natural processes.

  – *Evolution of marine environments: the impact* 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 observation, prevention, mitigation, adaptation, remediation and restoration of the natural and man-made environment:* related to water, climate, air, marine, urban and rural environment, soil, ***energy, minerals,*** waste treatment, recycling, clean production processes ***and sustainable products***, ***treatment and/or valuable re-use of residues or waste materials from energy production***, chemicals safety, protection of cultural heritage and of the built environment.

  – ***Protection, conservation and enhancement of cultural heritage, including human habitat: improved damage assessment for cultural heritage, development of innovative conservation strategies; fostering the integration of cultural heritage in the urban setting.***

– *Technology assessment, verification and testing*: methods and tools for environmental risk and lifecycle assessment of processes, technologies and products***, including alternative testing strategies and in particular non-animal testing methods***; support for sustainable chemistry, water supply and sanitation Platforms[1]; scientific and technological aspects of a future European environmental technologies verification and testing programme***, creation and dissemination of third-party assessment instruments***.

- **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 *the Global Earth Observation System of Systems (*GEOSS*)*; interoperability between systems and optimisation of information for understanding, modelling and predicating environmental phenomena***, and for assessing, exploring and managing natural resources***.

– *Forecasting methods and assessment tools **taking into account differing scales of observation**:* modelling links between economy/environment/society including market based instruments, externalities, thresholds and developing the knowledge base and methodologies for sustainability impact assessment on key issues such as land use and marine issues; social and economic tensions related to climate change.

*8.* **Transport (including Aeronautics)**

**Objective**

**Based on technological advances *to* develop integrated, "greener", "smarter" *and disability accessible* pan-European transport systems for the benefit of *all citizens* 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, *also facilitating the closing of the technological gaps at transatlantic level*.**

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

**Rationale**

Transport is one of Europe's strengths - the air transport sector *contributes 2.6% of 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"[1].

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 **and imply the development of innovative infrastructures**. Transport also has direct relevance *to* other major policies such as trade, competition, **the environment,** employment, cohesion, energy, security and the internal market. Investment in RTD in EU transport industries is a prerequisite to *ensuring* technological competitive advantage in global markets[2]. Activities at European level will also stimulate the restructuring of the industry, including the integration of the supply chain and in particular SMEs.

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[1]     *COM(2001)0370.*

[2]     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[1] support the need to take a new "transport systems" perspective that considers the interactions of vehicles *or vessels*, transport networks *or infrastructures* 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 *waterborne and* rail transport, *the"sustainable and safe maritime supply" of Europe,* affordability, safety, capacity, security and environmental impacts in an enlarged Union. *A strong technological foundation for a competitive EU fuel cell and hydrogen industry for transport applications - the "clean and safe vehicles" of the future - is of particular importance. Environmental research should include the development of this "clean and safe vehicle" of the future and the avoidance, reduction and optimisation of traffic.* 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: **developing technologies for the** reduction of emissions and noise disturbance, incorporating work on engines and alternative fuels, structures**, lighter materials** and new aircraft designs **including rotorcraft (helicopters and tiltrotors)**, airport operations and traffic management**, improved maintenance, repair and overhaul*.

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[1]    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.

– *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 **smaller** size vehicles **for city-centre to city-centre connections and any regional application (e.g. tiltrotors), also ensuring improved design in respect of disabled access to aircraft, developed in consultation with representative disability organisations**.

– *Improving cost efficiency:* reduction of costs associated with product development, manufacturing and operating costs focusing on **innovative and** zero maintenance**, repair and overhaul** 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 improved security design of aircraft.

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

– **Fostering general aviation research as a source of ideas and human resources across the whole aeronautics sector.**

- **Sustainable 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 **in particular hydrogen and fuel cells, taking account of cost-efficiency and energy-efficiency considerations**; end of life strategies for vehicles and vessels.

– *Fostering the objectives of the Marco Polo programme: specific research into the technical possibilities for, and benefits to health and the environment of a shift to "greener" modes of transport and of overall traffic avoidance.*

– *Encouraging modal shift and decongesting transport corridors:* development of innovative, intermodal and interoperable regional and national transport **and logistics** networks, infrastructures and systems in Europe **and methods for achieving their efficient operational use together with strategies providing transport links for urban and rural regions to corridors and higher-tier transport networks**; cost internalisation; information exchange between vehicle/vessel and transport infrastructure; **development of off-shore infrastructures;** optimisation of infrastructure capacity**, including activities addressing the interoperability and operational optimisation of local, regional, national and European transport networks, further experience with, and development of, the European Rail Traffic Management System**.

– *Ensuring sustainable **and accessible** urban mobility:* innovative organisation schemes, including clean and safe vehicles **and means** of transport **with lower levels of pollution**, **including those based on hydrogen and fuel cells, improving accessibility for persons with reduced mobility**, **improved and innovative solutions for transport vehicles and infrastructure - making them accessible to disabled persons,** new public **and/or collective** transportation modes **with a focus on efficiency throughout the entire mobility chain (public/collective transport, carsharing or pooling, walking and cycling)** and rationalisation of private transport, communication infrastructure, integrated town planning**, street works** and transport **incorporating modal shifts for freight traffic in line with environmental considerations; affordable schemes, balancing hardware and infrastructure measures with mobility management measures; management tools; smart software for integrated air quality, noise and traffic modelling; improving mobility between cities and their outer regions; mobility management and behavioural change measures**.

– *Improving safety and security:* as inherent to the transport system, in transport operations for drivers, passengers, crew, cyclists and pedestrians **and goods (including liquified natural gas)**, in the design of vehicles, vessels, **and infrastructures** 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 ***and maintenance***; integrative architectures.

• **Support to the European global satellite navigation system (Galileo) *and EGNOS*:** 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 *that could be used to rationalise terrestrial and marine transportation systems to increase efficiency and to improve safety and security;* e*nhancement of convergence between Galileo and all other existing transportation systems*.

*9*. **Socio-Economic Sciences and the Humanities**

**Objective**

**Generating an in-depth, shared understanding** *the* **complex and interrelated socio-economic challenges Europe is confronted with, such as** *demographic change and environmental challenges and all the consequences and opportunities they bring for* **growth, employment and competitiveness, social cohesion***, intercultural understanding and integration* **and sustainability, quality of life and global interdependence, in particular with a view to providing an improved knowledge base for policies in** *these* **fields** *, with the specific objective of developing the prerequisites for a modern sustainable society based on full employment*.

**Rationale**

Europe has a strong and *high-quality* research base in *the* socio-economic **and socio-cultural** 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 *much* 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 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 *EU* and, most significantly, *by* European citizens.

The activities to be supported are listed below and are expected to contribute significantly to *improving* the formulation, implementation, *impact* and *assessment* of policy in a wide range of areas such as economic, **scientific and technological,** social, education and training, **cultural, gender equality,** enterprise, international trade, consumer, external relations, justice and home affairs*,* and official statistics policies. In addition, opportunities will be provided to address emerging **demographic and** 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 growth, employment and competitiveness, ranging from innovation *to* education*,* including life-long learning*,* and the role of scientific and ***other national*** institutional contexts***; the central role of knowledge and intangible goods in the production of economic, social and cultural wealth and for social and environmental well-being on a world-wide scale***; ***age and policies on aging, linked to the necessary changes to social and welfare systems***.

- **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*,* social *and regional* cohesion in an enlarged EU*, from an interdisciplinary approach,* taking into account *the socio-economic impact of Community legislation, protection* of the environment*, sustainability, including sustainable urban planning, energy issues and the role of cities and metropolitan regions*.

- **Major trends in society and their implications:** such as demographic change including ageing and migration; lifestyles, work, families, *reconciling work and family life,* gender *equality* issues, health and quality of life; *growing inequalities*; *urban areas as complex eco-systems; urban competitiveness; public and private actors in the development and planning of cities and urban areas;* criminality; *the situation and quality of life of disabled persons, in particular the situation of disabled persons with complex dependency needs and disabled persons living in institutions in Europe, and the status of independent living schemes across Europe;* the role of business in society and population diversity, *ethnicity*, *religious pluralism,* cultural interactions*, including translation to facilitate cultural communication* and issues related to protection of fundamental rights and the fight against racism and intolerance *and the fight against all forms of discrimination; the positive impact of cultural heritage on the quality of life in towns and cities*; *urban governance; development of innovative instruments, approaches and training for more effective cooperation between different spheres of government and between public and private actors in the development of planning processes for cities and urban areas; inequalities despite economic development*.

- **Europe in the world: understanding changing** interactions*, intercultural relations* and interdependencies between world regions*, including the intercultural relations and interdependencies of the developing regions,* and their implications for the regions concerned, especially Europe*, in particular through historical and linguistic research*; addressing emerging threats and risks without undermining human rights, freedom and well-being.

- *Citizenship* **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 ***and equal*** participation by the peoples of Europe; ***continuous building of civil society in the enlarged Europe;*** effective and democratic governance including economic ***governance***.

- ***European multicultural heritage and identity: building a shared understanding of European cultures in terms of institutions, history, languages, values and practices; studying their convergences and divergences and the historical factors therefor; exploring the ways European cultural diversity and pluralism can support the future development and further integration of the EU.***

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

- ***Enlargement of the EU: research addressing the problems of EU enlargement, including economic transformation, delocalisation of industry, demographic changes, migrations, (re-)emerging diseases and their proliferation, fostering of democracy, development of  self governance, cultural heritage.***

- ***Peace in the context of the EU and the world: peace as a fundamental value, its positive consequences for the EU and the other regions of the world, problems caused by the absence of peace (war, insecurity) and relations between the regions as a consequence of securing peace.***

- *Research in the humanities: languages - language structure and language learning - literature, history, art history, geography and earth sciences, history of the territory, philosophy, and cultural heritage in relation to visual arts and crafts, architecture and cities.*

- *Urban research: to better understand thematic (environmental, transport, social, economic, etc.) and spatial (urban, regional) interactions in the city and to develop (i) innovative planning mechanisms to address the issues in an integrated and sustainable manner and (ii) innovative governance processes to enhance citizens' participation and cooperation between public and private actors; to better understand the roles of European cities in a global context (urban competitiveness); to support local authorities in improving social cohesion and fighting exclusion in cities where inequalities are growing despite economic development.*

*10.**    Security***

**Objective**

**To develop the technologies and knowledge for building** *the* **capabilities needed to ensure the security of citizens from threats such as terrorism,** *natural disasters* **and crime, while respecting fundamental human rights** *and privacy; to encourage conflict prevention and peaceful conflict resolution***; 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** *in finding* **security solutions** *while ensuring transparency and accountability, inter alia,  by way of consultation with the European Parliament***.**

*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 *in* realising a high level of security within an EU-wide area of justice, freedom and security[1] 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, environment *and health*.

Existing security related research activities in Europe suffer *from fragmentation* of efforts, *a* lack of critical mass of scale and scope and *a* 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 clear added value to the national level. As a consequence, security research at Community level will reinforce the competitiveness of the European security industry. *Security research should emphasise the Union's capabilities regarding surveillance, distribution of information and knowledge of threats and incidents as well as systems for better assessments and situation control through better use of common ICT systems in the fields of different operations. The research should be organised in such a way that it contributes to a common defence market in Europe.*

*The March 2004 Report of the Group of Personalities in the field of Security Research and the findings of the European Security Research Advisory Board have been taken into account in the drafting of the Rules for Participation. The special requirements concerning secrecy are enforced but the transparency of research findings has not been unnecessarily restricted. In addition, areas have been identified that permit the present transparency of research findings.*

*Special requirements are to be laid down in the field of security research for financial participation from the seventh Framework Programme on account of the structured nature of the market. The Commission's Preparatory Action for Security Research should provide guidance here.*

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[1]      Prevention, Preparedness, and response to terrorist attacks - *COM(2004)0698, 0700, 0701, 0702*; Solidarity/CBRN programme.

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 flexible by design 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.

*The SME definition for the security research sector does not do adequate justice to the objective of promoting small businesses. The diversity of company structures in this sector, as compared to other fields of research, has been taken into account in formulating the Rules for Participation by adjusting the figures for employment and turnover.*

**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*, including by developing strategic reserves and strategic medical counter-measure rapid production capacity*.

- **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*,* processes *and methods for rapid identification* required for improving the security of Europe's land and coastal borders, including border control and surveillance issues.

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

The above four areas will be supported by the following themes of a more cross-cutting nature:

- **Security systems integration***, interconnection* **and interoperability:** *intelligence, information gathering and home security,* 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. *Increased integration and interoperability is a priority in order for the EU to make full use of achievements in all areas mentioned above.*

- **Security and society:** mission orientated research which will focus *on analyses of the cultural, social, political and economic dimensions and consequences of terrorism and crime, the role of human values, policy making, the impact and role of media, conflict resolution*, scenario building and activities related to: crime, *psychology of terrorism and its social environment, citizens'* 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.

## *11.* **Space**

### *Objective*

*Supporting a European Space Programme focusing on applications such as Global Monitoring for Environment and Security (GMES) 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.*

**Rationale**

The EU can contribute in this field to the better definition of common objectives based on user requirements and policy objectives; to the coordination of activities in order 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, *forestry,* fisheries, environment, *health,* telecommunications, security and 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) requires new research and technologies. Space applications bring important benefits to the citizens *by virtue of technological spin-off effects and are indispensable in a high-tech society*.

The activities set out below aim at: the exploitation of space assets *(in coordination with in-situ assets, including airborne assets)* for the implementation of applications, namely *GMES  and* their contribution to law enforcement in EU policies; as well as space exploration *and on-orbit servicing infrastructure*, allowing international cooperation opportunities and dramatic technological breakthroughs *as well as cost-efficient missions*; exploitation and exploration of space supported through enabling activities guaranteeing the strategic role of the European Union. 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 additional support for 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.

*The Community activities set out below are to be carried out using existing capabilities in Europe, possibly by means of externalisation. Dispersion of resources by the creation of new entities and management structures is to be avoided.*

**Activities**

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

– GMES: development of satellite-based **and in-situ** monitoring 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 **integration, harmonization,** use and delivery of GMES data **(both satellite-based and in-situ, including ground-based, ship-borne and airborne)** and services.

– 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.

– **Development of space-based systems for risk prevention, risk management and all kinds of emergency, enhancing convergence with non-space systems.**

- **Exploration of space**

– **Maximisation of scientific added value through synergies with the European Space Agency and Member States' space agencies' initiatives in the field of space exploration; facilitation of access to scientific data**.

– **Coordination of efforts for the development of space-borne telescopes and detectors as well as for data analysis in space sciences.**

- **RTD for strengthening space foundations**

– Space transportation technology: research to increase the competitiveness of the European space transportation sector.

– Space sciences including **bio-medicine and** life **science** in space.

## 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 *both from the private and public sectors* on subjects of their choice and evaluated on the sole criterion of excellence as judged by peer review. *In all cases the research results will be communicated and disseminated.***

**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 *and translate it into economic value and growth*.

A Europe-wide competitive funding *structure* 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 *early-stage researchers* and new groups as well as established teams.

The EU activities in frontier research will be implemented by a European Research Council (ERC), *initially set up as an executive agency that will become an independent structure established under the procedure laid down in Article 251 of the Treaty. It will consist of a scientific council and an administrative board. The scientific council will be supported by temporary scientific staff chosen by the scientific council members*. *The management of the ERC will be carried out by staff either recruited for that purpose or seconded from EU institutions and will cover only the real administrative needs in order to assure the stability and continuity necessary for an effective administration.*

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 *selected from among the scientific community by the scientific council, ensuring the diversity of the scientists' research fields, following general criteria set by the European legislator, under the procedure as laid down in Article 251 of the Treaty. Members of the scientific council will be selected for a period of four years, renewable once for a maximum of an additional three years on a rotating system which will ensure the continuity of scientific Council's work*. The scientific council will, inter alia, *be fully responsible for* decisions on the type of research to be funded and act as guarantor of the quality of the activity from the scientific perspective *and the adoption of a code of conduct on the avoidance of conflicts of interest*. 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 administrative and staffing costs for the ERC (scientific council and dedicated implementation structure) may account for no more than 3% of the annual budget allocated to the ERC.*

The *scientific council and the administrative board  will report annually to the European Parliament and the Council on the* implementation and management of the *activity to* assess its achievements and to adjust and improve procedures on the basis of experience.

*For the initial transitional period the Commission shall ensure that the implementation of* the ERC *is in accordance with the principles of scientific excellence,* autonomy*, efficiency and transparency, and that it follows precisely the strategy and implementation methodology established by the Scientific Council. At the same time, the Commission will take all the initiatives necessary, under the procedure as laid down in Article 251 of the Treaty, to implement the European Research Council as a permanent, legally independent structure. The implementation and management of the ERC will be reviewed and evaluated on an ongoing basis in order to assess its achievements and to adjust and improve procedures on the basis of experience. An independent review will be carried out by 2008 of the ERC's structures and mechanisms, against the criteria of scientific excellence, autonomy, efficiency, accountability and transparency and with the full involvement of the Scientific Council. Following the evaluation, the structures and mechanisms of the ERC can be modified. The Commission will ensure that the necessary preparatory work is undertaken with a view to a transition to any modified structure required.*

*The ERC will have the faculty to conduct its own strategic studies in preparation for and support of its operative activities. In particular, it will have the power to consult with European, intergovernmental and national initiatives so as to avoid any duplicate financing of research at European and national level.*

### III PEOPLE

**Objective**

**Strengthening, quantitatively and qualitatively, the human potential in research and technology in Europe, by stimulating people to enter into the profession** *of researcher***, encouraging European researchers to stay in** *Europe, attracting* **to Europe researchers from the entire world,** *and* **making Europe more attractive to the best researchers. This will be done** *by applying the same set of instruments as under the sixth Framework Programme, with minor adjustments where necessary,* **by putting into place a coherent set of "Marie Curie" actions,** *with particular emphasis on the European added value they generate through the structuring effect they have on the European research area. These actions will address* **researchers at all stages of their careers, from initial research training** *specifically intended for young people* **to life long learning and career development** *in the public and private sectors. Efforts will also be made to ensure that a substantial part of the resources are allocated to actions increasing participation by women researchers, as their presence in these areas is still far smaller than that of men*.

**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 *investment* in research by public and private entities. Against the background of growing competition at world level, the development of an open European labour market for researchers**,** *free of all forms of discrimination,* and the diversification of skills and career paths of researchers are crucial *in supporting* a beneficial circulation of researchers and their knowledge, both within Europe and in a global setting.

*The actions envisaged under the seventh Framework Programme will include special measures to encourage early-stage researchers and support early stages of scientific career, as well as measures to reduce the "brain drain", such as reintegration grant to assist the return and reintegration of research workers.*

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. ***The "People" programme will be closely coordinated with the Training and Education Programmes as well as with other parts of the seventh Framework Programme. Another key component is the establishment of appropriate employment conditions, whether in terms of ensuring independence of research, bringing salaries into line with the best international standards, or taking greater care to ensure research workers are covered by social security and insurance schemes. Increasing the mobility of researchers and strengthening the resources of those institutions which attract researchers from other Member States will encourage centres of excellence and also spread that excellence around the EU.***

***Mobility for research workers applies to all sectors of scientific and technological research covered by the Seventh Framework Programme, while also taking future scientific developments into account.***

***In view of the fact that there is a low proportion of women in scientific professions in many European countries, the 'People' programme will make provision for actions to redress this anachronistic gender imbalance.***

***The EU and the Member States should launch actions at European, national and regional level to establish services which make it possible to reconcile work and family life.  This social policy will also have a significant impact on science and technology policy.***

***To meet the objective of 8 researchers for every 1000 employees, actions will have to address course structures and teaching methods with a view to engaging the interest of young people in a career in science.***

***Marie Curie actions are widely regarded as the best part of the previous Framework Programmes and have been highly successful. However, oversubscription has been a disincentive for participation in the Marie Curie programme which impacts upon the research community and the business community in particular.  A significant increase in the budget in the seventh Framework Programme is fully justified.***

**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*, including those relating to technology transfer and entrepreneurship*, and attracting more *early-stage 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. *Twinning networks, assuming closer integration of a few partners will be introduced based on the Erasmus scheme. Mobility of researchers will be encouraged by increased communication and links between the "People" programme and the "Capacity" programme.* 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*, while taking over the key characteristics from the Industry Host Fellowships under the Fifth Framework Programme. Reintegration grants for early-stage researchers, after their initial training period will be provided. Moreover, a permanent mechanism for horizontal coordination between the "People" programme and the higher education "Erasmus" programme will be introduced*.

- **Life-long training and career development** to support the career development *of 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 *the best doctoral students who could join well established research teams to work on their PhDs, for which mutual recognition of the quality of such training will be required as well as mutual recognition of diplomas and other certificates issued in connection with the programmes in question. Support is also foreseen for* researchers *in* particular *need of* additional/complementary competences and skills, for researchers to resume a research career after a break*, such as maternity or parental leave,* 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 individual* fellowships awarded directly at Community level. *The Commission will explore through a pilot scheme the possibility of* co-financing of regional, national or international programmes*, subject to compliance with the criteria of European added value, transparency and openness*.

- *The setting up of an autonomous and independent European network of universities under the aegis of the ERC.*

- **Industry-academia pathways and partnerships:** support to longer term co-operation programmes between organisations from academia and industry, in particular SMEs *and traditional manufacturing industries*, aims at increasing knowledge sharing through joint research partnerships, supported by the recruitment of experienced researchers *with experience of industry-academia partnership and of early-stage researchers* to the partnership, by staff secondments between both sectors, and by the organisation of events*, while taking over the key characteristics from the Industry Host Fellowships under the Fifth Framework Programme for such recruitment and secondment*. *In addition, it should be made easier for researchers to move from public to private research establishments and vice versa*.

- **The international dimension:** to increase the quality of European research by attracting research talent from outside Europe and fostering mutually beneficial research collaboration with researchers from outside Europe. This will be addressed through international outgoing fellowships (with an in-built mandatory return phase); international incoming fellowships; *and* partnerships to support the exchange of researchers. Common initiatives between European organisations and organisations 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 removing obstacles to mobility and enhancing the career perspectives of researchers in Europe*, including incentive measures for public institutions that promote the mobility, quality and profile of their researchers*. Furthermore, awards to improve the public awareness of Marie Curie actions and their objectives will be provided.

*In order to further facilitate researchers' mobility and interregional mobility (including within the same country), the activities funded by the Structural Funds and other instruments will be coordinated with those carried out under the seventh Framework Programme.*

## IV    CAPACITIES

This part of the *seventh* 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 **and research-driven techno-poles, including within the framework of the European Technology Platforms;**

– *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; enabling EU, national or regional information help desks to provide SMEs, industry and knowledge institutions with all relevant information on the seventh Framework Programme, the Competitiveness and Innovation** *Framework* **Programme and the Structural Funds***;*

– *horizontal* actions and measures in support of international**, *cross-border and interregional*** co-operation;

– **liasing on research and innovation and between industry and SMEs;**

– **increasing the visibility of European high-excellence research.**

The activities undertaken in this part of the seventh 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 ***policy evaluation*** 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. ***Special attention will be paid to (a) a synergetic approach to the development of research potential in combination with innovation-driven Structural Funds and programmes and (b) the reduction of administrative and physical obstacles to effective cross-border cooperation between regions from different Member States and the development of combined research and innovation capacity.***

## 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** *those* **new research infrastructures of pan-European interest needed by the European scientific community to remain at the forefront of the advancement of research, and** *to be in a position* **to help** *industry strengthen its knowledge base* **and its technological know how.**

### Rationale

Research infrastructures play an increasing role in the advancement *and exploitation* of *knowledge*. *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 European research potential and its exploitation ***and contributing to the development of the European Research Area***.

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.

*In order to support the dissemination of knowledge the application of a system of "knowledge vouchers" for SMEs financed at Member States level might prove a useful instrument. Knowledge and know-how which can be directly transformed into innovative commercial products may be offered to SMEs free of any charge through a national or regional system of "knowledge vouchers" for SMEs, thus enhancing the capacity of SMEs to innovate. "Knowledge vouchers" may profit from EU funding under the seventh Framework Programme and the Structural Funds (under the "regional competitiveness and employment" objective).*

The activities will be the following:

- **Support to existing research infrastructures**

– *trans-national access* to ensure that European researchers*, **including researchers from industry and SMEs,** 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*, **like clinical research infrastructures / networks for paediatric diseases,** and promote their coherent use and development

– *research e-infrastructure* by fostering the further development, evolution **and global connectivity** 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 **and based on open standards for interoperability**.

- **Support to new research infrastructures**

– *construction of new infrastructures and major updates of existing ones* to promote the creation of new research infrastructures, **for example to promote science, technology and the cultural heritage,** based on the work conducted **inter alia** by ESFRI[1] **without this being in any way considered as a condition for the payment of funds**, and which 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.

– **development of a scientific methods server which will greatly help to increase research efficiency, making available certain research findings under comparable conditions.**

– *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.

– **"Open Innovation" centres to allow for single-site execution of major collaborative industrial R&D projects, with consortium partners seconding their staff for temporary postings, and/or providing open access to research infrastructures and services on the basis of facility sharing.**

Infrastructures projects proposed for funding in this respect will be identified on the basis of **the following** criteria **alone**:

– **scientific excellence above all else**

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[1] 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 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 **and organisational** feasibility **and technological development capacity***

– *possibilities* for European partnership and commitment of major stakeholders**, the EIB and Structural Funds**

– *construction* and operating costs evaluated

– **contribution to the European Research Area**

– **contribution to the objective of developing 'research-based clusters of excellence'.**

As far as the construction of new infrastructures is concerned, **the potential for scientific excellence in the convergence regions as well as the outermost regions should be taken into account. *The*** efficient coordination of the Community financial instruments, Framework Programmes 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, *gain better access to pre-funding,* extend their networks, better exploit research results and acquire technological know how*; bridging the gap between research and innovation*.**

**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, *develop projects facilitating the market accessibility of research,* 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 *seventh* Framework Programme. *In the event of SME specific instruments becoming oversubscribed, the funding of the various Framework Programme instruments will be reviewed with a view to directing funding towards those instruments in demand.The synergies between the seventh Framework Programme and EUREKA can be harnessed to support partnering between large companies and SMEs.*

**Activities**

Specific actions in support *of* 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*; they may also serve as research providers for other project partners*. *Support will be given also to the creation of spin-offs as a means to commercialise research results*. Actions will be carried out in the entire field of science and technology*, following a bottom-up approach*. *Actions will cover research and demonstration activities bringing results closer to the market and linking this action line with instruments offered by the Competitiveness and Innovation Framework Programme*. Financial means will be allocated *through the following* schemes*:*

– *Research for SMEs: to* support small groups of innovative SMEs *and craft industries in Europe* to solve common or complementary technological problems*, through the seventh Framework programme and / or intergovernmental funding schemes, such as the Commission, the EIB and the European Bank of Reconstruction and Devlopment's JEREMIE and JASPER initiatives.*

– *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.

– *Research for civil society organisations: to support civil society organizations or networks of civil society organizations to commission research from research performers.*

*These three schemes will replace the cooperative research activities and collective research activities, implemented for SMEs in the sixth Framework Programme. In doing so, no change will be made in the administrative and management rules except where essential for the sake of simplification.*

*In addition, support will be granted to "national exploratory awards" schemes providing financial means to SMEs or SME associations to prepare proposals for the seventh Framework Programme.*

*Measures will be taken to facilitate participation by SMEs, such as the creation or further development of bodies specialised in assisting SMEs to participate in the seventh Framework Programe.*

The Competitiveness and Innovation *Framework* Programme will provide support to networks of intermediaries and national *and regional* schemes for actions *with the following objectives:*

– to encourage *SME participation in,* and facilitate *their access to the seventh Framework Programme; and,*

– *to ensure that SMEs take full advantage of the funding opportunities available under* 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*, interregional and cross-border* 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 *and facilitating the emergence of regional centres and/or clusters, thereby promoting regional development in Europe as well as developing the European Research Area*.

*Attention must be paid to the specific case of co-operation between adjacent border regions, as was the case under the INTERREG III programmes, and as laid down under the rules governing the territorial objective. The Regions of Knowledge initiative will incorporate solutions for cross-border problems as well as mechanisms to encourage cross-border regional co-operation in research irrespective of whether the regions concerned fall under either the convergence or the regional competitiveness objective.*

**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 **actions supporting implementation of regional innovation strategies**, joint analysis of research agendas of regional **or cross-border** 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 **and direct support to emerging Regions of Knowledge**. 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 **(in particular as regards use of Structural Funds),** the Competitiveness and Innovation *Framework* 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 **and with major national and regional programmes**, in particular with regard to convergence and outermost regions. **In this context, additional appropriations will be provided from the Structural Funds and possibly the EIB Group for strengthening regional technology transfer structures and in particular science and technology parks and complexes and innovation zones, incubators and techno-cells.**

**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[1], and helping to strengthen the capacities of their researchers to successfully participate in research activities at EU level.**

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[1] Convergence regions are those set out in Article 5 *of Council Regulation (EC) No [.../...] of [...]* laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund *(OJ L ...).* This includes "convergence" objective regions, regions eligible for funding from the Cohesion fund, and outermost regions.

**Rationale**

Europe does not fully exploit its research potential, in particular in less advanced regions remote from the European core *areas* of research and industrial development. In order to help researchers and institutions *from* 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 help* to fully realise the European Research Area in the enlarged Union.

**Activities**

The action in this domain will comprise support to:

• Trans-national two-way secondments of research staff between selected organisations in the convergence regions, and one or more partner *organisations; recruitment* by selected centres of incoming experienced researchers **and managers from Member States, associated countries, neighbourhood countries and third 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 and initiatives aiming at disseminating and transferring research results in other countries and on international markets*;*

• "Evaluation facilities" through which any research centre 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.

*Synergies will also be sought with the Competitiveness and Innovation Framework programme in order to promote the regional commercialisation of R&D in collaboration with industry.*

## SCIENCE IN SOCIETY

### Objective

**With a view to building an effective and democratic European** *knowledge-based* **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 reflection* **and debate** *at European level* **on science and technology, and their relation with society and culture.**

*Environmental policy in particular will form the meeting point between scientific knowledge and social development.*

### Rationale

The influence of science and technology on our daily lives becomes increasingly profound. Products *of 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 *continue* 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 undertaken in this field will comprise support to:

- Strengthening and improvement of the European science system, including: questions of scientific advice and expertise; *creation of a European knowledge bank;* the future of scientific publications; *measures to promote the indexing and conservation of scientific publications and make scientific publications more accessible to those members of the public wishing to consult them;* safeguards for scientific domains open to *misuse and fraud;* 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, including ethical issues*, such as the use of animals in testing and research*.

- Reflection and debate on science and technology and their place in society, drawing on history, sociology and philosophy of science and technology.

- *Risk assessment and management as a tool for decision making.*

- Gender research, including the integration of the gender dimension in all areas of research and the *promotion* of women in research *and in scientific decision-making bodies*.

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

- Development of a policy on the role of universities and the engagement of universities in the necessary reforms to face the challenges of globalisation.

- Improved *intercommunication and mutual understanding* between the scientific world and the wider audience of policy-makers, the media and the general public, by helping scientists better communicate *and present* their work and by supporting scientific information*, publications* and media.

These activities will take the form of, in particular, 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 Community* needs a strong and coherent international science and technology policy. ***An overall strategy for international cooperation encompassing all the international actions carried out under the different programmes within the seventh Framework Programme will be prepared.***

This international policy has ***three*** 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 contribute to the production of knowledge in Europe by enabling universities, research institutions and European firms to establish contact with their partners in third countries, thereby making it easier for them to access research carried out elsewhere in the world and helping to open up external markets to European firms.***

- 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 *seventh* Framework Programme will be targeted in particular at the following groups of countries:

- *accession and candidate* countries;

–   *countries* neighbouring the EU, Mediterranean partner countries, Western Balkans and the Newly Independent States;

–   *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, ***measures to support the implementation of the European strategy for international cooperation in science and technology will be implemented. In particular, actions and measures not covered in the "Cooperation" and "People" programmes, will be supported, and supplemented, when necessary, by specific cooperation actions of mutual interest.***

***The focus will be on bi-regional science and technology cooperation including priority setting and definition of science and technology cooperation policies and supporting the co-ordination of national policies on international science and technology co-operation.***

***Taking into account the experience gained with the International Association for the promotion of cooperation with scientists from the New Independent States of the Former Soviet Union (INTAS) in cooperating with the Eastern European and Central Asian countries, INTAS will be continued. Its activities will be funded from the "Cooperation", "People" and "Capacities" programmes.***

The overall coordination of the international cooperation actions under the different programmes of the *seventh* Framework Programme will be ensured.

# 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. *In this context, the JRC will provide support to the European Parliament and strengthen its relationship with the Parliamentary Committees and Members. Through a Working Group for the Interface between the European Parliament and the JRC, requests for studies and other requests will be addressed to the JRC by Parliament. Any research conducted by the JRC will be coordinated with the research undertaken under the thematic priorities, in order to avoid overlap and duplication.*

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.

*The Joint Research Centre will strengthen its unique position in the European Research Area at the heart of the Scientific European Culture. In facilitating access to its facilities by European and non European researchers, in particular early-stage scientists, it will increase its co-operation with other public and private research organisations, consistently improve the scientific quality of its own activities and contribute more scientifically to higher education and training, which shall remain a high priority for the JRC.*

**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.

– *To develop risk assessments and management procedures as tools for decision making, in particular with regard to the tasks of the European Parliament, Commission, Council, and Agencies.*

- **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 provide expertise and play a central role in GMES research activities and in the development of new applications in this field.*

– 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.

– *To promote and enhance the development and validation of alternative strategies, and in particular non-animal methods, in all relevant areas of research (safety assessment, vaccine testing, health and biomedical research, etc.).*

- **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** [*1] | **32492** |
| Health | **6134** |
| Food, Agriculture and Biotechnology | **1935** |
| *Fisheries and sustainable exploitation of the oceans* | **...** |
| Information and Communication Technologies | **9020** |
| Nanosciences, Nanotechnologies, Materials and new Production Technologies | **3467** |
| Energy | **2385** |
| Environment (including Climate Change) | **1886** |
| Transport (including Aeronautics) | **4150** |
| Socio-economic Sciences and the Humanities | **657** |
| *Security* | **1429** |
| *Space* | **1429** |
| | |
| **Ideas** | **7560** |

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

| | |
|---|---|
| **People** | *4777* |
| | |
| **Capacities** | *3944* |
| Research Infrastructures * | *1708* |
| Research for the benefit of SMEs | *1328* |
| Regions of Knowledge | *126* |
| Research Potential | *320* |
| Science in Society | *329* |
| Activities of International Co-operation | *133* |
| | |
| **Non-nuclear actions of the Joint Research Centre** | *1751* |
| | |
| **TOTAL** | *50524* |

\* Including a grant 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 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 seventh 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.

*In principle the choice of funding schemes should be left to research staff and only in very specific areas may* 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. ***Projects should be targeted on smaller project consortia and SMEs. For this purpose, projects with simple, short and quick procedures, devoid of complex financial principles and unnecessary reporting will be introduced.***

**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 *through portable grants* 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 *in all programmes*, *projects and initiatives, and also in* the Marie Curie actions. *Promotion of the conditions which make it easier for women to enter and pursue a research career.*

**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. *Efforts will be undertaken to mobilise additional financing from the EIB Group.*

b)     To support actions implemented on the basis of decisions *by the* European *Parliament and 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 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. *The Rules for Participation will include specific measures to ensure that as regards the implementation of Joint Technology Initiatives (JTIs), access and participation by SMEs and small research groups, including their adequate involvement in the decision taking procedures, is encouraged and supported. This aspect of the JTIs must be an element in their periodic evaluation after their establishment*.

- 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 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 support technology transfer activities and contribute to bridging the gap between research and its commercialisation by providing finance to the European Investment Fund to manage a Technology Transfer Facility. Subject to conditions to be specified in the specific programmes and in the Rules for Participation, the facility will finance technology transfer activities from universities, research centres or other legal entities active in the field of technology transfer.***

The Community will implement the funding schemes in compliance with the provisions of the *Rules for Participation*, 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 *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 to the Bank. The Community grant 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 *detailed arrangements* to be established by the *Rules for Participation* 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, new research infrastructures **and projects run by SMEs**). **Regional development actors should be consulted in the development of this "Risk-Sharing Finance Facility" in order to leverage R&D projects with private-sector investment.**

In the case of participants to an indirect action established in a region lagging in development (convergence regions and outermost regions[1]), 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.

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[1]     Convergence regions are those set out in Article 5 of Regulation (EC) *No [.../...]* [laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion *Fund]. This* includes "convergence" objective regions, regions eligible for funding from the Cohesion fund, and outermost regions.