COMMON POSITION (EC) No 27/2002

adopted by the Council on 28 January 2002

with a view to adopting Decision No .../2002/EC of the European Parliament and of the Council of ... concerning the sixth framework programme of the European Community for research, technological development and demonstration activities, contributing to the creation of the European Research Area and to innovation (2002 to 2006)

(2002/C 113 E/04)

(Text with EEA relevance)

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 [1],

Having regard to the opinion of the Economic and Social Committee [2],

Having consulted the Committee of the Regions,

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

Whereas:

(1) For the fulfilment of the tasks laid down in Article 2 of the Treaty, Article 163 of the Treaty provides that the Community is to have the objective of strengthening the scientific and technological bases of Community industry and encouraging it to become more competitive at international level, while promoting research activities deemed necessary by virtue of other Community policies.

(2) Article 164 of the Treaty enumerates the activities the Community is to carry out in pursuing these objectives, complementing the activities carried out in the Member States.

(3) The Treaty provides for the adoption of a multiannual framework programme setting out all Community research, technological development and demonstration (RTD) activities. This framework programme fully respects the principle of subsidiarity as set out in Article 5 of the Treaty.

(4) Pursuant to Article 165 of the Treaty, the Community and Member States are to coordinate their research and technological development activities so as to ensure that national policies and Community policy are mutually consistent.

(5) In 2000 the Commission submitted two communications, respectively on the prospects for and the objectives of creating a European Research Area, and on making a reality of the European Research Area and guidelines for European Union research activities in the period 2002 to 2006. In 2000 the Commission also submitted a communication on 'innovation in a knowledge-driven economy'.

(6) The European Councils in Lisbon in March 2000, Santa Maria de Feira in June 2000 and Stockholm in March 2001 adopted conclusions aimed at the rapid establishment of a European research and innovation area with a view to sustainable economic growth, more employment and social cohesion with the ultimate goal of enabling the Union, by 2010, to become the world's most competitive and dynamic knowledge economy.

The Göteborg European Council in June 2001 agreed on a strategy for sustainable development and added a third, environmental dimension to the Lisbon strategy.

In particular, the European Council in Lisbon underlined the importance of the Commission's *e*-Europe initiative, which aims at an information society for all, while the Stockholm European Council also stressed the need to make particular efforts in new technologies, especially biotechnology.

(7) The European Parliament [4] [5], the Council [6] [7], the Economic and Social Committee [8] and the Committee of the Regions [9] have also supported the creation of the European Research Area.

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[1] OJ C 180, 26.6.2001, p. 156.

[2] OJ C 260, 17.9.2001, p. 3.

[3] Opinion of the European Parliament of 14 November 2001, Council Common Position of 28 January 2002 and Decision of the European Parliament of ... (not yet published in the Official Journal).

[4] Resolution of 18 May 2000 (OJ C 59, 23.2.2001, p. 250).

[5] Resolution of 15 February 2001 (not yet published in the Official Journal).

[6] Resolution of 15 June 2000 (OJ C 205, 19.7.2000, p. 1).

[7] Resolution of 16 November 2000 (OJ C 374, 28.12.2000, p. 1).

[8] Opinion of 24 May 2000 (OJ C 204, 18.7.2000, p. 70).

[9] Opinion of 12 April 2000 (OJ C 226, 8.8.2000, p. 18).

(8) On 19 October 2000 the Commission submitted the conclusions of the external assessment of the implementation and results of the Community activities carried out in the five years preceding that assessment, accompanied by its observations.

(9) The sixth framework programme should have a structuring effect on research and technological development in Europe, including the Member States, associated candidate countries and other associated countries and make a significant contribution to the establishment of the European Research Area and to innovation.

(10) In accordance with Article 166(1) of the Treaty, it is necessary to establish the scientific and technological objectives and to fix the relevant priorities for the activities envisaged, the maximum overall amount, the detailed rules for Community financial participation in the sixth framework programme, as well as the respective shares in each of the activities envisaged, and to indicate the broad lines of the activities in question, which will be implemented in compliance with the objective of protecting the Community's financial interests. It is important to ensure sound financial management of the sixth framework programme.

(11) It is appropriate to place special emphasis on the needs of small and medium-sized enterprises (SMEs).

(12) The sixth framework programme should provide an important contribution to the development of scientific and technical excellence and to the coordination of European research. The framework programme should stress the importance of involving associated candidate countries in the Community's research policy and in the European Research Area.

(13) Specific targeted projects and coordination actions may also be used as a 'stairway of excellence' to facilitate the access of smaller research actors of scientific excellence, including SMEs, as well as research actors from associated candidate countries, to the activities of this framework programme.

(14) The participation of the outermost regions in Community RTD actions through appropriate mechanisms adapted to their particular situation should be facilitated.

(15) The international and global dimension in European research activities is important in the interest of obtaining mutual benefits. The sixth framework programme is open to the participation of countries having concluded the necessary agreements to this effect, and is also open on the project level, and on the basis of mutual benefit, to the participation of entities from non-member countries and of international organisations for scientific cooperation. Specific activities will be undertaken in support of participation of scientists and institutions from developing countries, Mediterranean countries including the Western Balkans as well as Russia and the newly independent States (NIS).

(16) The Joint Research Centre should contribute to the implementation of the framework programme, where it can provide independent, customer-driven support for the formulation and implementation of Community policies, including the monitoring of implementation of such policies, in the areas of its specific competence.

(17) Research activities carried out within the sixth framework programme should respect fundamental ethical principles, including those which are reflected in Article 6 of the Treaty on European Union and in the Charter of Fundamental Rights of the European Union.

(18) Following the Commission communication 'A mobility strategy within the European Research Area', the mobility of researchers will be promoted, with a view to the successful creation of the European Research Area.

(19) Following the Commission communication 'Women and science' and the resolutions of the Council of 20 May 1999 [1] and 26 June 2001 [2] and the Resolution of the European Parliament of 3 February 2000 on this theme, an action plan is being implemented in order to reinforce and increase the place and role of women in science and research, and further enhanced action is needed.

(20) The Commission should submit regular progress reports to the European Parliament and the Council on the implementation of the sixth framework programme. It is also appropriate that the Commission, in good time and before submitting its proposal for the seventh framework programme, has an independent assessment carried out of the implementation of the activities undertaken, which should be done in a spirit of openness with respect to all the relevant actors.

(21) Implementation of the sixth framework programme may give rise to the participation of the Community in programmes undertaken by several Member States or to the setting up of joint undertakings or other arrangements within the meaning of Articles 169 to 171 of the Treaty.

(22) The Scientific and Technical Research Committee (CREST) has been consulted,

HAVE DECIDED AS FOLLOWS:

Article 1

1. A multiannual framework programme for Community research, technological development and demonstration activities, hereinafter referred to as the 'sixth framework programme' is hereby adopted for the period 2002 to 2006.

[1] OJ C 201, 16.7.1999, p. 1.

[2] OJ C 199, 14.7.2001, p. 1.

2. The sixth framework programme shall comprise all Community activities envisaged in Article 164 of the Treaty.

3. The sixth framework programme shall contribute to the creation of the European Research Area and to innovation.

4. Annex I sets out the scientific and technological objectives and the related priorities and indicates the broad lines of the activities envisaged.

Article 2

1. The maximum overall amount for Community financial participation in the entire sixth framework programme shall be EUR 16 270 million. The proportion assigned to each of the activities is fixed in Annex II.

2. The detailed rules for financial participation by the Community shall be governed by the Financial Regulation applicable to the general budget of the European Communities, supplemented by Annex III.

Article 3

All the research activities carried out under the sixth framework programme must be carried out in compliance with fundamental ethical principles.

Article 4

In the context of the annual report to be submitted by the Commission pursuant to Article 173 of the Treaty, the Commission shall report in detail on progress with implementing the sixth framework programme, and in particular progress towards achieving its objectives and meeting its priorities; information on financial aspects shall also be included.

Article 5

The sixth framework programme shall be implemented through specific programmes. These programmes shall establish precise objectives and the detailed rules for implementation.

Article 6

1. The Commission shall continually and systematically monitor, with the help of independent qualified experts, the implementation of the sixth framework programme and its specific programmes.

2. Before submitting its proposal for the next framework programme, the Commission shall have an external assessment carried out by independent highly qualified experts of the implementation and achievements of Community activities during the five years preceding that assessment.

The Commission shall communicate the conclusions thereof, accompanied by its observations, to the European Parliament, the Council, the 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 ACTIVITIES AND PRIORITIES

INTRODUCTION AND GENERAL OUTLINE

The sixth framework programme (this programme) will be carried out to further the objective set out in Article 163(1) of the Treaty, 'of strengthening the scientific and technological bases of Community industry and encouraging it to become more competitive at international level, while promoting all the research activities deemed necessary by virtue of other Chapters of this Treaty'.

In order to achieve this more effectively, and in order to contribute to the creation of the European Research Area and to innovation, this programme will be structured around the following three headings, under which the four activities as set out in Article 164 of the Treaty will be undertaken:

— focusing and integrating Community research,

— structuring the European Research Area,

— strengthening the foundations of the European Research Area.

The activities under these three headings will contribute to the integration of research efforts and activities on a European scale as well as contributing to the structuring of the various dimensions of the European Research Area. Coordination of activities carried out under these headings will be ensured.

Small and medium-sized enterprises (SMEs) will be encouraged to participate in all areas of this programme, in particular in the context of the activities carried out in the priority thematic areas.

International participation in these activities will be assured. Participation will be open to all countries having concluded Association Agreements with the Community to this effect. Other non-member countries may participate in this programme via bilateral cooperation agreements.

Researchers and organisations from non-member countries may also participate on a case-by-case basis in projects. The detailed conditions under which entities from non-member countries and international organisations involved in research activities may participate in this programme, including the financial arrangements, are specified in the Decision which will be adopted pursuant to Article 167 of the Treaty.

Participation in the activities of this programme will be encouraged through publication of the necessary information on content, conditions and procedures, to be made available in a timely and thorough manner to potential participants, including those from the associated candidate and other associated countries.

During the implementation of this programme and in the research activities arising from it, fundamental ethical principles including animal welfare requirements, are to be respected. These include, *inter alia*, principles reflected in the Charter of Fundamental Rights of the European Union, protection of human dignity and human life, protection of personal data and privacy as well as the environment in accordance with Community law and, where relevant, international Conventions, such as the Declaration of Helsinki, the Council of Europe Convention on Human Rights and Biomedicine signed in Oviedo on 4 April 1997 and the Additional Protocol on the Prohibition of Cloning Human Beings signed in Paris on 12 January 1998, the UN Convention on the Rights of the Child, the Universal Declaration on the Human Genome and Human Rights adopted by Unesco, and the relevant World Health Organisation (WHO) resolutions, the Amsterdam Protocol on Animal Protection and Welfare; and current legislation, regulations and ethical guidelines in countries where the research will be carried out.

1. Focusing and integrating Community research

The activities carried out under this heading, which will represent the major part of the efforts deployed under this programme, are intended to integrate research efforts and activities on a European scale. They will be focused primarily on seven clearly defined thematic priority areas, while further specific measures will be undertaken across a wider field of scientific and technological research.

The Joint Research Centre (JRC) will provide independent customer-driven support for the formulation and implementation of Community policies, including the monitoring of implementation of such policies, within its areas of specific competence.

1.1. *Thematic priorities*

Seven priority thematic areas are identified, namely:

1. genomics and biotechnology for health;

2. information society technologies;

3. nanotechnologies and nanosciences, knowledge-based multifunctional materials, and new production processes and devices;

4. aeronautics and space;

5. food quality and safety;

6. sustainable development, global change and ecosystems;

7. citizens and governance in a knowledge-based society.

1.2. *Specific activities covering a wider field of research*

1.2.1. Supporting policies and anticipating scientific and technological needs: activities in support of Community policies and research responding to new and emerging scientific and technological needs;

1.2.2. horizontal research activities involving SMEs: these specific activities are intended to help European SMEs in traditional or new areas to boost their technological capacities and develop their ability to operate on a European and international scale;

1.2.3. specific measures in support of international cooperation: in support of external relations and the development policy of the Community, specific measures aimed at encouraging international research cooperation will be undertaken. In principle, the following three groups of non-member countries will be involved:

(a) developing countries;

(b) Mediterranean countries, including the Western Balkans;

(c) Russia and the newly independent States (NIS).

1.3. *Non-nuclear activities of the Joint Research Centre*

Two specific research areas have been selected for JRC activities, namely:

(a) food, chemical products and health,

(b) environment and sustainability.

2. **Structuring the European Research Area**

Activities in this area will cover the following:

2.1. *Research and innovation*

Activities to stimulate technological innovation, utilisation of research results, transfer of knowledge and technologies and the setting up of technology businesses in the Community and in all its regions will be carried out under this heading to complement the activities relating to innovation under the heading 'Focusing and integrating Community research'.

2.2. *Human resources and mobility*

Activities to support the development of world-class human resources in all the regions of the Community by promoting transnational mobility for training purposes, development of expertise or transfer of knowledge between different sectors, supporting the development of excellence and helping to make Europe more attractive to the best of non-member country researchers. The potential offered by all sectors of the population, especially women, should be developed through appropriate supporting measures.

2.3. *Research infrastructures*

Activities to promote the optimum use of, including access to, research infrastructures and to support the identification, planning and, in duly justified cases, setting-up of advanced research facilities of European interest.

2.4. *Science and society*

Activities to encourage harmonious relations between science and society and the awareness of society in respect of innovation, as a result of new relations and informed dialogue between researchers, industrialists, political decision-makers and citizens.

3. **Strengthening the foundations of the European Research Area**

Activities to step up the coordination and support the coherent development of research and development policies in Europe. They would provide financial support for measures such as the opening up of national programmes.

A more detailed description of the activities carried out under these three headings is set out below.

1. FOCUSING AND INTEGRATING COMMUNITY RESEARCH

The activities carried out under this heading will represent the major part of the research efforts deployed under this programme, intended to contribute to the general objective of the Treaty of strengthening the scientific and technical bases of Community industry and encouraging it to be more competitive at international level, while promoting all the research activities deemed necessary by other Chapters of the Treaty. In order to bring about European added value by assembling a critical mass of resources, this programme will focus on seven, clearly defined thematic priority areas where Community research efforts will be integrated by pulling them together and making them more coherent, on a European scale.

Throughout the activities under this heading, special attention will be given to technological innovation, and to the initial development of highly innovative enterprises in areas of vital interest to European competitiveness. Exploratory research at the leading edge of knowledge will be carried out on subjects closely related to one or more topics in the thematic priority. Measurements and testing aspects will also receive necessary emphasis. The principle of sustainable development, socioeconomic, ethical and wider cultural aspects of the envisaged activities, and gender equality, will be duly taken into account, where relevant for the activity concerned.

To complement efforts in the thematic priorities, specific horizontal research activities will address SMEs, innovation and international cooperation as well as respond to Community policy objectives and future and emerging research needs.

1.1. **Thematic priorities**

1.1.1. Genomics and biotechnology for health [1]

Objective

The activities carried out in this area are intended to help Europe exploit, by means of an integrated research effort, breakthroughs achieved in decoding the genomes of living organisms, more particularly for the benefit of public health and citizens and to increase the competitiveness of the European biotechnology industry. In the field of applications, the emphasis will be put on research aimed at bringing basic knowledge through to the application stage to enable real and consistent progress in medicine and improve the quality of life.

[1] Fundamental knowledge in genomics (including human/animal/plant) is covered by the first priority, as well as its applications to human health. Applications to food are covered by the fifth priority (for example relating to nutrition/better quality food). Other issues related to life sciences are addressed under the sixth priority or covered, as appropriate, by Section 1.2.1 ('Policy oriented research') as well as Heading 3.

Justification of the effort and European added value

'Post-genomic' research based on analysis of the human genome and genomes of other organisms, will culminate in numerous applications in various health-related sectors, and notably in the development of new diagnostic tools and new treatments capable of helping to combat diseases that are not at present under control, offering major potential markets. This research may also have implications on research on areas such as environment and agriculture.

To enable the Union to improve its position in this area and benefit fully from the economic and social spin-offs of the expected developments, as well as contribute to the international debate, it is necessary both to increase investment significantly and integrate the research activities conducted in Europe within a coherent effort.

Actions envisaged

The Community activities carried out to this end will address the following aspects.

A. Advanced genomics and its applications for health

(a) fundamental knowledge and basic tools for functional genomics in all organisms:

(i) gene expression and proteomics;

(ii) structural genomics;

(iii) comparative genomics and population genetics;

(iv) bioinformatics;

(v) multidisciplinary functional genomics approaches to basic biological processes;

(b) application of knowledge and technologies in the field of genomics and biotechnology for health:

(i) technological platforms for the developments in the fields of new diagnostic, prevention and therapeutic tools (including pharmacogenomic approaches, stem cell research and alternative methods to animal testing).

B. Combating major diseases

(a) Application-oriented approach to medical genomics knowledge and technologies including the use of animal and plant genomics where relevant, mainly in the following fields ([1]):

(i) combating diabetes, diseases of the nervous system including where relevant mental illness, cardiovascular diseases, and rare diseases;

(ii) combating resistance to antibiotics and other drugs;

(iii) studying human development, the brain and the ageing process.

(b) A broader approach will be pursued with regard to:

(i) cancer, with a focus on the development of patient-oriented strategies from prevention to diagnosis and treatment;

(ii) combating the three poverty-linked infectious diseases (Aids, malaria and tuberculosis) which have priority in terms of disease control at Union and international level.

([1]) See also Section 1.2.1 'Policy support and anticipating scientific and technological needs' and Heading 3 (Strengthening the foundations of the European Research Area) for other health-related topics.

1.1.2. Information society technologies (IST)

Objective

The activities carried out in this area, pursuant to the conclusions of the Lisbon European Council and the objectives of the *e*-Europe initiative, are intended to stimulate the development in Europe of both hardware and software technologies and applications at the heart of the creation of the information society in order to increase the competitiveness of European industry and allow European citizens in all Union regions the possibility of benefiting fully from the development of the knowledge-based society.

Justification of the effort and European added value

At the dawn of the 21st century, information and communication technologies are revolutionising the functioning of the economy and society, and are generating new ways of producing, trading and communicating.

This has become the Union's second most important sector of the economy, with an annual market of EUR 2 000 billion and employing more than 2 million persons in Europe, a number that is steadily rising.

Europe is well positioned to lead and shape the future development not only of technologies but also of their impact on our life and work. The future competitiveness of all European industry and the living standards of Europe's citizens depend largely on future efforts in IST research in order to prepare the future generation of products, processes and services.

Industrial and commercial successes of the kind that Europe has achieved in mobile communications as a result of the global system for mobile communication (GSM) standard will not be repeated unless a concerted effort is made to invest a critical mass of research resources in this area, by integrating public and private sector efforts on a European scale.

With a view to exerting maximum impact in economic and social terms, effort should focus on the future generation of those technologies in which computers, interfaces and networks will be more integrated into the everyday environment and will render accessible, through easy and 'natural' interactions, a multitude of services and applications. This vision of 'ambient intelligence' (interactive intelligent environment) seeks to place the user, the human being, at the centre of the future development of the knowledge-based society.

Community actions will concentrate on the technological priorities that will make it possible to realise this vision. They will aim at mobilising the community of researchers around targeted initiatives, such as the development of the next generations of mobile communication systems, so as to achieve medium and long-term objectives while being able to react to the new needs and demands of markets as well as those of public policy and citizens.

Actions envisaged

The actions undertaken will therefore address the following technological priorities.

Integrating research into technological areas of priority interest for citizens and businesses

Completing and building on progress expected in the development of basic technologies, research aimed at finding solutions for major societal and economic challenges, faced by an emerging knowledge-based society including the consequences for work and the workplace environment, and, accordingly, focusing on:

(a) research on technologies addressing the key security challenges posed by the 'all-digital' world and the need to secure the rights and privacy of citizens;

(b) 'ambient intelligence' systems offering access to the information society for all, regardless of age and situation, as well as interactive and intelligent systems for health, mobility, security, leisure, tourism, access to and preservation of the cultural heritage, and environment;

(c) electronic and mobile commerce, as well as technologies for secure transactions and infrastructures, new tools and new methods of work, technologies for learning (such as e-learning) and systems for corporate knowledge management, for integrated business management for e-government taking account of user needs;

(d) large-scale distributed systems and platforms, including global resource information database (GRID)-based systems that provide effective solutions to complex problems in areas such as the environment, energy, health, transport and industrial design.

Communication and computing infrastructures

Mobile, wireless, optical and broadband communication infrastructures and computing and software technologies that are reliable, of wide application and can be adapted to meet the growing needs of applications and services. Work will focus on:

(a) the new generations of wireless and mobile communications systems and networks; satellite communications systems; all-optical technologies; integration and management of communication networks, including interoperable network solutions; capacity-enhancing technologies necessary for the development of systems, infrastructures and services, in particular for audiovisual applications. Work will also lead to the development of the next Internet generation;

(b) software technologies architectures, distributed and embedded systems supporting the development of multifunctional and complex services that involve multiple actors engineering and control of complex and large-scale systems to ensure reliability and robustness.

Components and microsystems

Miniaturised and low-cost components based on new materials and integrating extended functionalities, with the effort focusing on:

(a) the design and production of nano-, micro-, and opto-electronic and photonic components, including those used for information storage, pushing the limits of miniaturisation and minimising the costs and power consumption of micro-electronic and micro-system components, and taking account of the environmental impact of IST systems;

(b) nano-electronics, microtechnologies, displays and microsystems, and multidisciplinary research into new materials and quantum devices; new computing models and concepts.

Information management and interfaces

Research into information management tools and interfaces, with a view to enabling easier interaction everywhere and at all times with knowledge-based services and applications, addressing:

(a) knowledge representation and management systems based on context and semantics, including cognitive systems, as well as tools for creating, organising, navigating, retrieving, sharing, preserving and disseminating digital content;

(b) multisensorial interfaces capable of understanding and interpreting the natural expression of human beings through words, gestures and the various senses, virtual environments, as well as multilinguistic and multicultural systems indispensable to the establishment of the knowledge-based society on a European scale.

1.1.3. Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices

Objective

The activities carried out in this area are intended to help Europe achieve a critical mass of capacities needed to develop and exploit, especially for greater eco-efficiency and reduction of discharges of hazardous substances to the environment, leading-edge technologies for the knowledge-based products, services and manufacturing processes of the years to come.

Justification of the effort and European added value

Manufacturing industry in Europe at present produces goods and services valued at around EUR 4 000 billion a year. In an increasingly competitive world market, it must maintain and increase its competitiveness while meeting the requirements of sustainable development. To do so, it is necessary to put substantial effort into the design, development and dissemination of advanced technologies: nanotechnologies, knowledge-based multifunctional materials and new production processes.

Lying at the frontier of quantum engineering, materials technology and molecular biology, and one of the foreseeable hubs of the next industrial revolution, nanotechnologies need considerable investment.

Europe has significant expertise in certain sectors such as nano-manufacturing and nanochemistry, and needs to increase and coordinate its effort in this area.

Where materials are concerned, the aim is to develop intelligent materials which are expected to add considerable value in terms of applications in sectors such as transport, energy, electronics and the biomedical sector and for which there is a potential market of several tens of billions of euro.

The development of flexible, integrated and clean production systems will also require a substantial research effort concerning the application of new technologies to manufacturing and management.

Actions envisaged

Nanotechnologies and nanosciences:

(a) long-term interdisciplinary research into understanding phenomena, mastering processes and developing research tools;

(b) supramolecular architectures and macromolecules;

(c) nano-biotechnologies;

(d) nanometre-scale engineering techniques to create materials and components;

(e) development of handling and control devices and instruments;

(f) applications in areas such as health, chemistry, energy, and the environment.

Knowledge-based multifunctional materials:

(a) development of fundamental knowledge;

(b) technologies associated with the production and transformation including processing of knowledge-based multifunctional materials and of biomaterials;

(c) support engineering.

New production processes and devices:

(a) the development of new processes and flexible and intelligent manufacturing systems incorporating advances in virtual manufacturing technologies, interactive decision-aid systems high-precision engineering and innovative robotics;

(b) systems research needed for sustainable waste management and hazard control in production and manufacturing, including bio-processes, leading to a reduction in consumption of primary resources and less pollution;

(c) development of new concepts optimising the life cycle of industrial systems, products and services.

1.1.4. Aeronautics and space

Objective

The aim of activities carried out in this area is two-fold: to strengthen, by integrating its research efforts, the scientific and technological bases of the European aeronautics and space industry and encouraging it to become more competitive at international level; and to help exploit the potential of European research in this sector with a view to improving safety and environmental protection.

Justification of the effort and European added value

The aerospace industry consists of two technologically and economically separate sectors but they are closely associated on account of their industrial and political implications and the stakeholders involved and they are examples of where Europe has a tradition of success, and economic and commercial potential.

However, United States investment in aerospace is three to six times higher, depending on the sector.

In an increasingly demanding competitive environment, foreseeable aviation requirements worldwide correspond to some 14 000 new aircraft over the next 15 years, representing a market worth EUR 1 000 billion. The efforts made to integrate industrial capacities and development activities that have brought about European successes in this area, now need to be matched by similar efforts to integrate research into priority themes and subjects.

With this aim in view, European, national and private sector research efforts should be optimised around a common vision and a strategic research agenda.

On space, following on from the Commission's communication 'Europe and space: turning to a new chapter', the Community will support research designed to make use of space for the benefit of markets and society.

Actions envisaged

Aeronautics

Community aeronautical research activities including air transport systems will address research and technological development activities necessary in order to:

(a) increase the competitiveness of the European industry with regard to civil aircraft, engines and equipment;

(b) reduce the environmental impact of aircraft, including fuel consumption, environmental nuisances and loads (CO_2 and NO_X emissions, noise);

(c) increase aircraft safety in the context of the substantial rise in air traffic;

(d) increase the capacity and safety of the air transport system, in support of a 'single European sky' (air traffic control and management systems).

Space

Community space activities carried out in close coordination with the European Space Agency (ESA), the other space agencies, research centres and industry, in order to strengthen the coherence of the very major investment involved, will address:

(a) research on satellite-based information systems and services relevant for the Galileo satellite navigation project;

(b) research on satellite-based systems relevant for the global monitoring for environment and security (GMES) platform, taking into account the needs of users;

(c) advanced research needed to integrate the space segment and the Earth segment in the field of communications.

1.1.5. Food quality and safety

Objective

The activities carried out in this area are intended to help establish the integrated scientific and technological bases needed to develop an environmentally friendly production and distribution chain of safer, healthier and varied food, including seafood and to control food-related risks, relying in particular on biotechnology tools taking into account the results of post-genomic research, as well as to control health risks associated with environmental changes.

Justification of the effort and European added value

The recent food crises, and in particular bovine spongiform encephalopathy (BSE), have highlighted both the complexity of food safety issues and the fact that in most cases they have international and cross-border implications.

The integration of the European internal market as regards agriculture and food makes it necessary to address the problems that arise in this area, and hence to carry out related research, on a European scale. It is against this background that the European Food Safety Authority will shortly be established.

Citizens and consumers expect that research will help to ensure that the food and products marketed are of high quality, healthy and can be consumed in safety. To this end, emphasis should be placed on the whole food production chain, 'from fork to farm', including, where appropriate, application of animal and plant sciences and biotechnology to this area. Requirements relating to animal welfare and health should be taken into account.

This requires the availability of the most complete, precise and up-to-date scientific knowledge. Apart from the public health aspect, the prosperity of a sector representing some EUR 600 billion in terms of annual turnover and 2,6 million jobs is at stake.

Given that small enterprises constitute a major part of the food sector, the success of activities undertaken will rely on the adaptation of knowledge and processes to the specific characteristics of these enterprises.

Europe also needs to be able to make a substantial contribution to the research efforts on these issues, which now arise at world level, as well as a coherent contribution to the international debate on them, based on the most precise and complete knowledge.

The same remarks apply to the various aspects of the problems associated with the health impact of environmental factors (e.g. endocrine disruptors, carcinogens) which are a source of growing concern for European citizens, and which often manifest themselves on an international scale. For all these reasons, but also in order to derive the benefit of the combination of the best sources of expertise available in complex areas, the research in question should be carried out at European level in such a way as to ensure genuine coordination of national activities.

Actions envisaged

Community activities will cover research, including, where appropriate, post-genomics research, relating to various aspects of the control of health risks and links between health and food:

(a) safer and environmentally friendly production and processing methods and healthier, nutritious, functional and varied foodstuffs and animal feed, based on systems such as integrated production, lower-input farming including organic agriculture, and the use of plant and animal sciences and biotechnologies;

(b) epidemiology of food-related diseases and allergies, including the impact of diet on the health of children;

(c) impact of food, for instance new products, products resulting from organic farming, functional food, products containing genetically modified organisms and those arising from recent biotechnology developments on health;

(d) 'traceability' processes all along the production chain, for instance relating to genetically modified organisms, including those based on recent biotechnology developments;

(e) methods of analysis, detection and control of chemical contaminants and existing or emerging pathogenic micro-organisms (such as viruses, bacteria, yeasts, fungi, parasites and new agents of the prion type including development of ante-mortem diagnostic tests for BSE and scrapie);

(f) impact of animal feed, including products containing genetically modified organisms and the use of sub-products of different origins for that feed, on human health;

(g) environmental health risks linked to the food-chain (chemical, biological and physical), and combined exposures of authorised substances, including impact of local environmental disasters and pollution on the safety of foodstuffs, with emphasis being placed on cumulative risks, transmission routes to human beings, long-term effects and exposure to small doses, as well as the impact on particularly sensitive groups, and especially children.

1.1.6. Sustainable development, global change and ecosystems

Objective

The activities carried out in this area are intended to strengthen the scientific and technological capacities needed for Europe to be able to implement sustainable development, emphasised by the Göteborg European Council, and integrating its environmental, economic and social objectives with particular regard to renewable energy, transport, and sustainable management of Europe's land and marine resources. These activities should enable Member States, the associated candidate and other associated countries to make a significant contribution to the international efforts to understand and control global change and preserve the equilibrium of ecosystems.

Justification of the effort and European added value

The implementation on a global scale of sustainable development requires more particularly:

(a) the design, development and dissemination of technologies and solutions, such as promotion of changes in energy consumption behaviour, making it possible to ensure the conservation and more rational and sustainable use of natural resources, with less waste and a reduction in the impact of economic activity on the environment. Sectors of strategic importance in this context include energy and transport, especially the urban and regional development aspects of these sectors;

(b) a better understanding of ecosystems and of the mechanisms and impacts of global change (for instance climate change), including the effect of these mechanisms on land and marine resources; as well as the development of related forecasting capacities.

Where technology is concerned, as highlighted in the Commission Green Paper 'Towards a European strategy for the security of energy supply' and in the Commission's White Paper 'European transport policy for 2010: time to decide', two areas concerned as a matter of priority are energy and transport, which are responsible for over 80 % of total emissions of greenhouse gases and more than 90 % of CO_2 emissions.

Under the 1997 Kyoto Protocol to the 1992 United Nations Framework Convention on climate change, the European Union is required to reduce its greenhouse gas emissions by 8 % compared with the 1990 levels in the period 2008 to 2012. This will require the development of innovative sustainable energy and transport solutions. Other important commitments are contained in international instruments such as the 1992 UN Convention on Biological Diversity, the 1994 UN Convention to Combat Desertification in Countries Seriously Affected by Drought and/or Desertification, particularly in Africa, and the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer as well as in the Union strategy for sustainable development, including the sixth environment action programme.

Achieving the above objective in the short term requires a major effort to deploy technologies currently under development. Community action is important to ensure coordination of Europe's contribution to world efforts.

Above and beyond this objective, the long-term implementation of sustainable development in the coming decades makes it necessary to ensure the availability, under economic conditions, of the most appropriate energy sources and carriers in this respect. This will require a sustained longer-term research effort.

Medium and long-term research efforts will also be necessary to develop sustainable European transport systems, and to make progress in the context of global change and protection of biodiversity and preserving ecosystems which would also contribute to the sustainable use of land and marine resources. In the context of global change, strategies for an integrated, sustainable use of agricultural and forest ecosystems are of particular importance for the preservation of these ecosystems and will contribute substantially to the sustainable development of Europe.

Actions envisaged

The Community's RTD efforts will concentrate on activities in the following areas.

I. Sustainable energy systems [1]

(a) in the short and medium term, especially in the urban environment:

(i) clean energy, in particular renewable energy sources and their integration in the energy system, including storage, distribution and use;

(ii) energy savings and energy efficiency, including those to be achieved through the use of renewable raw materials;

(iii) alternative motor fuels;

(b) in the medium and longer term:

(i) fuel cells including their applications;

(ii) new technologies for energy carriers/transport and storage on a European scale, in particular hydrogen technology;

(iii) new and advanced concepts in renewable energy technologies with a significant future energy potential and requiring long-term research efforts;

(iv) disposal of CO_2 associated with cleaner fossil fuel plants.

II. Sustainable surface transport [2]

(a) developing environmentally friendly transport systems and means of transport of passengers and freight, and clean urban transport with rational use of the car in the city:

(i) new technologies and concepts for surface transport, including novel propulsion systems and integration of fuel cells for transport purposes;

(ii) advanced design and productions techniques leading to improved quality, safety, recyclability, comfort and cost-effectiveness;

(b) making rail and maritime transport more effective and more competitive, addressing the interoperability of transport modes, and assuring intelligent and safe transport of passengers and freight:

(i) rebalancing and integrating different modes, in particular in the urban and regional context, making rail and maritime transport more effective (for example, by means of promoting intermodality);

(ii) increasing safety, and avoiding traffic congestion (in particular in urban areas), through the integration of innovative electronics and software solutions and by means of the use of advanced satellite navigation systems and telematics solutions.

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[1] Other energy related topics are included under Section 1.2.1 ('Policy support and anticipating scientific and technological needs') and in Heading 3.

[2] Other transport policy-related topics (such as transport security, tools and indicators for transport system performance and forecasting) are dealt with under Section 1.2.1 ('Policy support and anticipating scientific and technological needs').

III. Global change and ecosystems

Community activities will address the following aspects as a matter of priority:

(a) impact and mechanisms of greenhouse gas emissions and atmospheric pollutants from all sources, including those resulting from energy supplies, transport and agriculture on climate, ozone depletion and carbon sinks (oceans, forests and soil) in particular to improve prediction and to evaluate mitigation options;

(b) water cycle, including soil-related aspects;

(c) understanding marine and terrestrial biodiversity, marine ecosystem functions, protection of genetic resources, sustainable management of terrestrial and marine ecosystems and interactions between human activities and the latter;

(d) mechanisms of desertification and natural disasters;

(e) strategies for sustainable land management, including integrated coastal zone management (ICZM), and including integrated concepts for the multipurpose utilisation of agricultural and forest resources, and the integrated forestry/wood chain;

(f) operational forecasting and modelling, including global climate change observation systems.

Research undertaken under this priority will be complemented by the development of advanced methods for risk assessment and methods of appraising environmental quality, including relevant prenormative research on measurements and testing for these purposes.

1.1.7. Citizens and governance in a knowledge-based society

Objective

The activities carried out in this area are intended to mobilise in a coherent effort, in all their wealth and diversity, European research capacities in economic, political, social sciences and humanities that are necessary to develop an understanding of, and to address issues related to, the emergence of the knowledge-based society and new forms of relationships between its citizens, on one hand and between its citizens and institutions, on the other.

Justification of the effort and European added value

At the European Council in Lisbon in March 2000, the European Union set itself the ambitious objective of becoming 'the most competitive and dynamic knowledge-based economy in the world, capable of sustained economic growth providing more and better jobs and greater social cohesion'.

In this perspective, the European Council in Lisbon underlined that 'human resources are Europe's main strength', stressing the need for Europe's education and training systems to 'adjust both to the needs of the knowledge-based society and to the need to raise the level of employment and improve quality'.

Europe's transition towards a knowledge-based economy and society, and its sustainable development in the interests of the quality of life of all citizens will be all the easier if it takes place in a way which is properly understood and managed. This requires a substantial research effort concerning the issues of integrated and sustainable economic and social progress based on the fundamental values of justice and solidarity and cultural diversity which characterise the European model of society, as well as research on issues relating to entrepreneurship and the setting up, growth and development of small enterprises.

In this respect, economic, political, social and human sciences research should more particularly help to ensure the harnessing and exploitation of an exponentially increasing quantity of information and knowledge and an understanding of the processes at work in this area.

In Europe, this issue arises in particular in connection to the future enlargement, the functioning of democracy and new forms of governance, and in the general context of this. What is at stake is the relationship between citizens and institutions in a complex political and decision-making environment characterised by the coexistence of national, regional and European decision-making levels and the increasing role of civil society and its representatives in the political debate.

Issues such as these have a clear and intrinsic European dimension, and there is much to be gained by examining them from a global perspective, taking into account the historical dimension as well as the cultural heritage.

This European dimension is only just starting to be taken into account in research conducted at national level, and is not yet receiving all the attention that it requires.

It seems highly appropriate to address these aspects on the European scale. What is more, action taken at Union level will make it possible to ensure the requisite degree of methodological coherence and guarantee that full benefit is derived from the rich variety of approaches existing in Europe and European diversity.

Actions envisaged

Action by the Community will focus on the following themes.

Knowledge-based society and social cohesion:

(a) research with reference to the objectives set by the Lisbon European Council and subsequent Councils, in particular systematic analysis of best methods for improving the production, transmission and utilisation of knowledge in Europe;

(b) options and choices for the development of a knowledge-based society serving the Union objectives emphasised at the Lisbon, Nice and Stockholm European Councils, in particular as regards improving the quality of life, social, employment and labour market policies, life-long learning, and strengthening social cohesion and sustainable development with due consideration for the various social models in Europe;

(c) variety of transition dynamics and paths towards the knowledge-based society at local, national and regional level.

Citizenship, democracy and new forms of governance, in particular in the context of increased integration and globalisation, and from the perspectives of history and cultural heritage:

— consequences of European integration and enlargement of the Union for democracy, the concept of legitimacy, and the functioning of Union institutions through a better understanding of political and social institutions in Europe, and their historical evolution,

— research on the redefinition of and the relationship between areas of competence and responsibility, and new forms of governance,

— issues connected with the resolution of conflicts and restoration of peace and justice,

— emergence of new forms of citizenship and cultural identities, forms and impact of integration and cultural diversity in Europe; social and cultural dialogue involving Europe as well as the rest of the world.

In operational terms, Community activities will focus on support for:

(a) transnational research and comparative studies and the coordinated development of statistics and qualitative and quantitative indicators;

(b) interdisciplinary research in support of public policies;

(c) the establishment and exploitation on a European scale of research infrastructures and data and knowledge bases.

1.2. **Specific activities covering a wider field of research**

1.2.1. *Policy support and anticipating scientific and technological needs*

These activities will assure efficient and flexible conduct of research essential for the fundamental objectives of the Community, by underpinning the formulation and implementation of Community policies and by exploring new and emerging scientific problems and opportunities, where these requirements cannot be satisfied under the thematic priorities.

A feature common to these activities is that they will be implemented within a multiannual perspective which takes direct account of the needs and viewpoints of the main associated actors (as appropriate: policy makers, industrial user groups, leading edge research communities, etc.). In principle, they will be implemented in conjunction with an annual programming mechanism, by which specific priorities, corresponding to identified needs and falling within the objectives indicated above, will be determined.

A. Policy-oriented research

Research activities under this heading are intended to respond to the scientific and technological needs of the policies of the Community, underpinning the formulation and implementation of Community policies, bearing in mind also the interests of future members of the Community and the associated countries. They may include pre-normative research, measurement and testing where necessary for the needs of Community policies.

These activities require flexible, policy-driven definition and specific actions and methods of intervention to complement the thematic priorities and to be coordinated within the overall context of this programme.

They will accordingly include themes linked to the thematic priorities, but which do not lend themselves to the science-driven approach for identifying the relevant individual topics. Appropriate division of tasks, and synergy, will also be assured between these activities and the direct actions of the Joint Research Centre, oriented towards the needs of the Community policies.

The areas concerned to be supported are as follows:

(a) the common agricultural policy (CAP) and the common fisheries policy (CFP);

(b) sustainable development, in particular the Community policy objectives relating to environment (including those set out in the sixth environment action programme), transport and energy;

(c) other Community policies, namely health (in particular public health), regional development, trade, development aid, internal market and competitiveness, social policy and employment, education and training, culture, gender equality, consumer protection, the creation of an area of freedom, security and justice, and external relations, including those policies in support of enlargement, and including the requisite statistical methods and tools;

(d) Community policy objectives derived from the orientations given by the European Council with regard to, for instance, economic policy, the information society as well as *e*-Europe and enterprise.

Within these areas, the research priorities, responding to initially identified policy needs, which will be supplemented during the course of the implementation of this programme, are as follows.

1. ***Sustainable management of Europe's natural resources***

Research under this heading will in particular focus on:

(a) the modernisation and sustainability of agriculture and forestry, including their multifunctional role in order to ensure the sustainable development and promotion of rural areas;

(b) tools and assessment methods for sustainable agriculture and forestry management;

(c) the modernisation and sustainability of fisheries, including aquaculture-based production systems;

(d) new and more environment friendly production methods to improve animal health and welfare;

(e) environmental assessment (soil, water, air, noise, including the effects of chemical substances).

2. ***Providing health, security and opportunity to the people of Europe***

Research under this heading will in particular focus on:

(a) health determinants and the provision of high quality and sustainable health-care services and pension systems (in particular in the context of ageing and demographic change);

(b) public health issues, including epidemiology contributing to disease prevention and responses to emerging rare and communicable diseases, allergies, procedures for secure blood and organ donations, non-animal test methods;

(c) the impact of environmental issues on health (including methods for risk assessment and the mitigation of risks of natural disasters to people);

(d) issues relating to handicapped/disabled people (including equal access facilities);

(e) understanding of migration and refugee flows;

(f) understanding crime trends in the context of public safety;

(g) issues related to civil protection, including biosecurity, and crisis management.

3. ***Underpinning the economic potential and cohesion of a larger and more integrated European Union***

Research under this heading will in particular focus on:

(a) underpinning European integration, sustainable development, competitiveness and trade policies (including improved means to assess economic development and cohesion);

(b) the development of tools, indicators and operational parameters for assessing sustainable transport and energy systems performance (economic, environmental and social);

(c) global safety analysis and validation systems for transport and research relating to accident risks and safety in mobility systems;

(d) forecasting and developing innovative policies for sustainability in the medium and long term;

(e) information society issues (such as management and protection of digital assets, and inclusive access to the information society);

(f) the protection of cultural heritage;

(g) improved quality, accessibility and dissemination of European statistics.

B. Research to explore new and emerging scientific and technological problems and opportunities

The research activities carried out under this heading are intended to respond flexibly and rapidly to major unforeseeable developments, emerging scientific and technological problems and opportunities, as well as needs appearing at the frontiers of knowledge, more specifically in multithematic and interdisciplinary areas.

In this context, the following activities will be carried out:

(a) research in emerging areas of knowledge and on future technologies, outside or cutting across the thematic priority areas, in particular in transdisciplinary fields, which is highly innovative and involves correspondingly high (technical) risks. It will be open to new scientific endeavours at the frontiers of knowledge and technological know-how that have significant potential for major industrial and/or social impact, or for the development of Europe's research capabilities in the longer term;

(b) research to assess rapidly new discoveries, or newly observed phenomena, which may indicate emerging risks or problems of high importance to European society, and identify appropriate responses to them.

In identifying potential research topics under this heading, special attention will be given to the views of the research community and to areas where European action is appropriate in view of the potential to develop strategic positions at the leading edge of knowledge and in new markets, or to anticipate major issues facing European society.

1.2.2. *Horizontal research activities involving SMEs*

Carried out in support of European competitiveness and enterprise and innovation policy, these specific activities are intended to help European SMEs in traditional or new areas to boost their technological capacities and develop their ability to operate on a European and international scale.

Information and advice about the possibilities of SME involvement will be ensured via entry points set up by the Commission, and by making use of the national contact point scheme.

In addition to these specific research activities for SMEs, SMEs will be encouraged to participate in all areas of this programme, in particular in the context of the activities carried out in the priority thematic areas.

Actions that may be carried out in the entire field of science and technology covered by Community research policy, will take the form of:

(a) Cooperative research activities

Research activities carried out by RTD performers for a number of SMEs on themes of common interest. These activities may also be carried out by innovative SMEs in cooperation with research centres and universities;

(b) Collective research activities

Research activities carried out by RTD performers for industrial associations or industry groupings in entire sectors of industry where SMEs are prominent at the European level, including dissemination of results.

1.2.3. *Specific measures in support of international cooperation*

In support of the external relations, including the development policy of the Community, specific measures aimed at encouraging international research cooperation will be undertaken. Apart from these specific measures, non-member country participation will be possible within the thematic priorities. The following groups of non-member countries will be involved:

(a) developing countries;

(b) Mediterranean countries, including the Western Balkans;

(c) Russia and the newly independent States (NIS) including, in particular, activities carried through the International Association for the Promotion of Cooperation with Scientists from the NIS (INTAS).

The research priorities in this category of activities are defined according to the interests and objectives of the partnership between the Community and the groups of countries concerned, as well as their specific economic and social needs.

In order to facilitate the involvement of these countries a single entry point within the Commission will be created for information about activities undertaken in the fields of international cooperation.

These activities are complementary to international research cooperation undertaken within the thematic priority areas.

1.3. **Non-nuclear activities of the Joint Research Centre (JRC)**

In accordance with its mission of providing scientific and technical support for Community policies, the JRC will provide independent, customer-driven support for the formulation and implementation of Community policies, including the monitoring of the implementation of such policies, within the areas of its specific competence.

The JRC will carry out its activities in close cooperation and by networking with scientific circles, national research organisations, universities and businesses in Europe. It is entitled to participate in all research activities of this programme on the same basis as entities established in Member States. Special attention will be given to cooperation with candidate countries.

The essential common denominator of the JRC's activities will be the safety of citizens in its different aspects, for example health, environment and combating fraud.

Under this heading, the JRC will carry out the following activities.

1. Activities to be carried out in accordance with the JRC mission. These activities will be clearly geared towards customer needs. In this context, there will be a degree of flexibility for unexpected research needs:

   Research will be concentrated on two core areas related to two of the priority thematic areas:

   (a) food, chemical products and health, with particular attention to: food safety and quality, in particular to combat BSE; genetically modified organisms; chemical products, including validation of alternative non-animal testing procedures; biomedical applications (more particularly the establishment of references in this area);

   (b) environment and sustainability, with particular attention to: climate change (carbon cycle, modelling, impacts) and technologies for sustainable development (renewable energy sources, tools for the integration of policies); improvement of air quality, protection of the European environment; development of reference measurements and networks; technical support for the objectives of GMES.

2. Horizontal activities in domains for which the JRC has specific competence:

   (a) technology foresight: technological and economic foresight work based on the activities of European networks;

   (b) reference materials and measurements: the Community Reference Bureau (BCR) and certified reference materials; validation and qualification of chemical and physical measurement methods;

   (c) the safety of citizens and anti-fraud: detection of antipersonnel mines; prevention of natural and technological hazards; networks in support of cybersecurity; fraud control technologies.

2. STRUCTURING THE EUROPEAN RESEARCH AREA

2.1. **Research and innovation**

Objective

These activities are intended to stimulate technological innovation, utilisation of research results, transfer of knowledge and technologies and the setting up of technology businesses in the Community and in all its regions, not least in the less developed areas. Innovation is also one of the most important elements throughout this programme.

Justification of the effort and European added value

Europe's comparatively poor ability to transform the results of research work and scientific and technological breakthroughs into industrial, economic and commercial successes, is one of its most notable weaknesses. Actions to stimulate business innovation at European level can help to raise the overall level of Europe's performance and increase European capacities in this area, by helping businesses and innovators in their efforts to operate on a European scale and on international markets, and by giving stakeholders in all regions of the Union the benefit of the experience and knowledge acquired in other regions through initiatives undertaken at this level.

Actions envisaged

Activities will be carried out under this heading to complement activities relating to innovation included in those carried out under Heading 1.

These actions will provide general support to innovation, and will complement national and regional activities, with a view to increasing the coherence of efforts in this area. They will take the form of support for:

(a) networking of stakeholders and users in the European innovation system and carrying out analyses and studies in order to promote exchanges of experience and good practice and to engage users better in the innovation process;

(b) actions to encourage transregional cooperation regarding innovation and support for the setting-up of technology businesses, as well as for the preparation of regional and transregional strategies in this area, including the accession countries;

(c) actions to experiment with new tools and new approaches concerning technological innovation addressing in particular critical points in the innovation process;

(d) establishment or consolidation of information services and in particular electronic services, such as Cordis, and assistance services relating to innovation (technology transfer, protection of intellectual property, access to risk capital); including the activities of innovation relay centres;

(e) economic and technological intelligence activities (analyses of technological developments, applications and markets and processing and dissemination of information which may help researchers, entrepreneurs, and in particular SMEs, and investors in their decision-making);

(f) analysis and evaluation of innovation activities carried out in the framework of Community research projects and exploitation of lessons that can be drawn from innovation policies.

Some of these activities will be carried out in liaison with those of the European Investment Bank (EIB) (in particular by means of the European Investment Fund (EIF)) under its 'Innovation 2000 Initiative' as well as in coordination with measures taken through the Structural Funds.

2.2. **Human resources and mobility**

Objective

The activities carried out under this heading are intended to support the development of abundant world class human resources in all the regions of the Community by promoting transnational mobility for training purposes, the development of expertise or the transfer of knowledge, in particular between different sectors; supporting the development of excellence; and helping to make Europe more attractive to non-member country researchers. This should be done with the aim of making the most of the potential offered by all sectors of the population, especially women and younger researchers, taking appropriate measures for this purpose, including those taken towards creating synergies in the area of higher education in Europe.

Justification of the effort and European added value

Promoting transnational mobility is a simple, particularly effective and powerful means of boosting European excellence as a whole, as well as its distribution in the different regions of the Union. It creates opportunities for significantly improving the quality of the training of researchers, promotes the circulation and exploitation of knowledge, and helps to establish world-class centres of excellence that are attractive throughout Europe. Union level action in this area (as in human resources in general) leading to the attainment of critical mass will inevitably have a major impact.

Attention will be paid to the participation of women within all actions, and appropriate measures to promote a more equitable balance between men and women in research; the personal circumstances relating to mobility, particularly with respect to the family, career development and languages; the development of research activity in the less-favoured regions of the Union and associated countries, and to the need for increased and more effective cooperation between research disciplines and between academia and industry, including SMEs.

In cooperation with the most appropriate national and Community actions, attention will be paid to the provision of practical assistance to foreign researchers in matters (legal, administrative, family or cultural) relating to their mobility.

Actions envisaged

These activities, which will be carried out in the whole field of science and technology, will take in particular the following forms:

(a) support measures for universities, research centres, businesses including in particular SMEs and networks, for the hosting of European and non-member country researchers, including training of pre-doctoral researchers. These activities could include the setting up of long-term training networks and encouraging mobility between different sectors;

(b) individual support measures for European researchers for the purposes of mobility to another European or a non-member country, and for top-class non-member-country researchers wishing to come to Europe. Such support will provide for a sufficiently long training period and focus on researchers with at least four years of research experience, while also addressing the needs of training in research management;

(c) financial contribution to national or regional programmes in support of researcher mobility open to researchers from other European countries;

(d) support for the creation and development of European research teams which are considered as having the potential to reach a high level of excellence, more particularly for leading edge or interdisciplinary research activities where such support can add value to national measures;

(e) scientific prizes for work of excellence carried out by a researcher having received Union financial support for mobility.

Mechanisms will be set up to facilitate the return of researchers to their countries or regions of origin, and their professional reintegration.

Efforts aimed at achieving equal gender representation in the actions envisaged will be ensured.

2.3. **Research infrastructures**

Objective

The activities carried out under this heading are intended to help establish a fabric of research infrastructures of the highest level in Europe and to promote their optimum use on a European scale.

Justification of the effort and European added value

The development of a European approach with regard to research 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: by helping to ensure wider access to the infrastructures existing in the different Member States and increasing the complementarity of the facilities in place; by promoting the development or establishment of infrastructures ensuring a service on a European scale, as well as optimum construction choices in European terms and in terms of regional and transregional technological development.

These activities will be carried out in the whole field of science and technology, including in the priority thematic areas.

Actions envisaged:

(a) transnational access to research infrastructures;

(b) implementing integrated activities, by means of European-scale infrastructures or consortia of infrastructures, making it possible to ensure the provision of services on a European scale and possibly covering, in addition to transnational access, the establishment and operation of cooperation networks, and the execution of joint research projects; raising the level of the performance of the infrastructures concerned;

(c) a high-capacity and high-speed European communication infrastructure (possibly based on GRID-type architectures), building on the achievements of the Géant project as well as electronic publishing services;

(d) carrying out feasibility studies and preparatory work for the creation of new European scale infrastructures taking into account the needs of all potential users and systematically exploring the possibilities of contributions from, for example the EIB or the Structural Funds for the funding of these infrastructures;

(e) optimising of European infrastructures by providing limited support for the development of a restricted number of projects for new infrastructures in duly justified cases where such support could have a critical catalysing effect in terms of European added value. This support, taking due account of Member States' opinion, may supplement contributions from the EIB or the Structural Funds to the funding of these infrastructures.

2.4. **Science and society**

Objective

The activities carried out under this heading are intended to encourage the development of harmonious relations between science and society and the opening-up of innovation in Europe, as well as contributing to scientists' responsiveness to societal concerns, as a result of the establishment of new relations and an informed dialogue between researchers, industrialists, political decision-makers and citizens. The activities under this heading are policy related science and society initiatives, while the research activities under the thematic priorities and in particular thematic priority 7 cover in a broader manner research relating to citizens and governance.

Justification of the effort and European added value

Science/society issues need to a large extent to be addressed at European level on account of their strong European dimension. This is bound up with the fact that very often they arise on a European scale (as the example of food safety problems shows), with the importance of being able to benefit from the often complementary experience and knowledge required in the different countries and with the need to take into account the variety of views on them, which reflects European cultural diversity.

Actions envisaged

The activities carried out in this area in the whole field of science and technology will in particular address the following themes:

(a) bringing research closer to society: science and governance; scientific advice; involvement of society in research; foresight;

(b) responsible use of scientific and technological progress, in harmony with fundamental ethical values: assessment, management and communication of uncertainty and risk; expertise; analysis and support to best practice in the application of the precautionary principle in different areas of policy making; European reference system; research on ethics in relation to science, technology developments and their applications;

(c) stepping up the science/society dialogue: new forms of dialogue with the participation of relevant stakeholders; knowledge of science by citizens; stimulation of awareness; promoting young people's interest in scientific careers; initiatives aimed at promoting the role and place of women in science and research at all levels.

They will take the form of activities in support of:

(a) networking and establishment of structural links between the institutions and activities concerned at national, regional and European level, in particular using information society technologies;

(b) exchange of experience and good practice;

(c) carrying out specific research;

(d) high-profile awareness-raising initiatives such as prizes and competitions;

(e) establishing data and information bases and carrying out studies, in particular statistical and methodological studies, on the different themes.

3. STRENGTHENING THE FOUNDATIONS OF THE EUROPEAN RESEARCH AREA

Objective

The activities carried out under this heading are intended to step up the coordination and to support the coherent development of research and innovation-stimulation policies and activities in Europe.

Justification of the effort and European added value

Making a reality of the European Research Area depends first and foremost on improving the coherence and coordination of research and innovation activities and policies conducted at national, regional and European level. Action by the Community can help to promote efforts to this end, as well as to lay the foundations in terms of the information, knowledge and analyses that are essential for the successful completion of this project.

Actions envisaged

A. Coordination activities, using a bottom up approach, will be carried out in the whole field of science and technology in areas such as:

(a) health: health of key population groups; major diseases and disorders (e.g. cancer, diabetes, cardiovascular diseases, hepatitis, visual impairment), rare diseases and major diseases linked to poverty in developing countries; activities involved will be implemented, for instance, through coordination of research and comparative studies, development of European databases and interdisciplinary networks, exchange of clinical practice and coordination of clinical trials;

(b) biotechnology: non-health and non-food applications;

(c) environment: urban environment (including sustainable urban development and cultural heritage); marine environment and land/soil management; seismic risk;

(d) energy: new generation power plants ('near-zero-emission'), energy storage, transport and distribution.

These activities will take the form of stepping up the coordination of research activities carried out in Europe, at both national and European level with financial support for:

(a) the mutual opening-up of national and regional programmes;

(b) networking of research activities conducted at national and regional level;

(c) the administration and coordination activities of European cooperation in the field of scientific and technological research (COST);

(d) scientific and technological coordination activities carried out in other European cooperation frameworks, in particular the European Science Foundation;

(e) collaboration and joint initiatives of specialised European scientific cooperation organisations such as CERN, EMBL, ESO and the ESA [1].

These actions will be implemented in the general context of efforts undertaken to optimise the overall performance of European scientific and technological cooperation and ensure that its different components, including COST and Eureka, are complementary.

[1] CERN: European Organisation for Nuclear Research; EMBL: European Molecular Biology Laboratory; ESO: European Southern Observatory; ESA: European Space Agency.

B. In order to support the coherent development of research and innovation policies in Europe:

(a) carrying out analyses and studies, and work relating to scientific and technological foresight, statistics and indicators;

(b) setting-up and support for the operation of specialised working groups and forums for concertation and political debate;

(c) support for work on the benchmarking of research and innovation policies at national, regional and European level;

(d) support for carrying out work on the mapping of scientific and technological excellence in Europe;

(e) support for carrying out the work needed to improve the regulatory and administrative environment for research and innovation in Europe.

ANNEX II

MAXIMUM OVERALL AMOUNT, RESPECTIVE SHARES AND INDICATIVE BREAKDOWN

The maximum overall financial amount and the respective indicative shares of the various activities as referred to in Article 164 of the Treaty are as follows:

	(EUR million)
First activity (1)	13 740
Second activity (2)	600
Third activity (3)	300
Fourth activity (4)	1 630
Maximum overall amount	16 270

(1) Covering the activities carried out under the heading 'Focusing and integrating Community research', with the exception of international cooperation activities; research infrastructures, and the theme 'Science and society' carried out under the heading 'Structuring the European Research Area' and activities carried out under the heading 'Strengthening the foundations of the European Research Area'.

(2) Covering the international cooperation activities carried out under the heading 'Focusing and integrating Community research', in the thematic priority areas and under the heading 'Specific activities covering a wider field of research'.

(3) Covering the specific activities on the theme 'Research and innovation' carried out under the heading 'Structuring the European Research Area' in addition to innovation activities carried out under the heading 'Focusing and integrating Community research'.

(4) Covering the activities concerning human resources and support for mobility carried out under the heading 'Structuring the European Research Area'.

These activities will be carried out under the following headings (the indicative financial breakdown is set out):

			(EUR million)
1. Focusing and integrating Community research			13 285
Thematic priorities (1)		11 205	
— genomics and biotechnology for health	2 200		
— advanced genomics and its applications for health	1 150		
— combating major diseases	1 050		
— information society technologies (2)	3 600		
— nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices	1 300		
— aeronautics and space	1 075		
— food quality and safety	685		
— sustainable development, global change and ecosystems	2 120		
— sustainable energy systems	810		
— sustainable surface transport	610		
— global change and ecosystems	700		
— citizens and governance in a knowledge-based society	225		
Specific activities covering a wider field of research		1 320	
— policy support and anticipating scientific and technological needs	570		
— horizontal research activities involving SMEs	450		
— specific measures in support of international cooperation	300		
Non-nuclear activities of the Joint Research Centre		760	

2. Structuring the European Research Area			2 655
— research and innovation	300		
— human resources	1 630		
— research infrastructures (3)	665		
— science and society	60		
3. Strengthening the foundations of the European Research Area			330
— support for the coordination of activities	280		
— support for the coherent development of policies	50		
		Total	16 270

(1) Of which at least 15 % for SMEs.
(2) Including up to EUR 100 million for the further development of Géant and GRID.
(3) Including up to EUR 200 million for the further development of Géant and GRID.

ANNEX III

INSTRUMENTS AND RULES FOR FINANCIAL PARTICIPATION BY THE COMMUNITY

The Community will contribute financially, under the specific programmes, and subject to the rules for participation, to research and technological activities, including demonstration activities, of this programme.

These activities, which will incorporate measures to encourage innovation, will be implemented by means of a range of instruments described below, and referred to as 'indirect RTD actions', to which the Community will contribute financially. In addition, the Community will undertake activities implemented by the JRC, and which are referred to as 'direct actions'.

1. **Instruments**

Introduction

An instrument implementing an action must be commensurate with the scope and objectives of the research activity concerned, and will take into account, as appropriate, the views of the research community. Accordingly, the size of an action may vary in relation to the themes and subjects it covers, depending on the critical mass of expertise necessary to obtain European added value and achieve the expected results. In some cases, this may be achieved by the clustering of actions dedicated to different aspects of one and the same objective.

All actions should involve, as appropriate, universities or institutions of higher education of a similar level, research organisations and industry, including SMEs. They could entail activities relating to dissemination, transfer and exploitation of knowledge as well as analysis and evaluation of the economic and social impact of the technologies concerned and the factors involved in their successful implementation.

As a general rule, selection of actions will be based on open calls for proposals and independent peer review, except in duly justified cases. All research activities will be reviewed regularly and this will, in particular, involve monitoring of the level of research excellence. The participation of SMEs including enterprise groupings of SMEs, and smaller entities will be encouraged.

Concerning research in the Priority Thematic areas (under Heading 1 as defined in Annex I):

— the importance of the new instruments (integrated projects and networks of excellence) is recognised as being an overall priority means to attain the objectives of critical mass, management simplification and European added value contributed by Community research in relation to what is already undertaken at national level, and of the integration of the research capacities. However, the size of projects is not a criterion for exclusion, and access to new instruments is ensured for SMEs and other small entities,

— the new instruments will be used from the start of this programme in each theme and, where deemed appropriate, as a priority means, while maintaining the use of specific targeted research projects and coordination actions,

— in 2004 an evaluation will be undertaken by independent experts of the effectiveness of each of these three types of instruments in the execution of this programme.

Research activities in areas involving 'specific activities covering a wider field of research' (under Heading 1) will take the form of specific targeted research projects and specific research projects for SMEs. Networks of excellence and integrated projects may, however, be used in certain duly justified cases, where the objectives in question can be better achieved by these means.

Activities referred to under Heading 2 (Structuring the European Research Area) and Heading 3 (Strengthening the foundations of the European Research Area), will take the form of specific targeted research and innovation projects, integrated infrastructure initiatives and actions to promote human resources and mobility.

In addition, specific support actions, coordination actions and participation of the Community in programmes undertaken by several Member States pursuant to Article 169 of the Treaty may be applied throughout this programme.

1.1. **Networks of excellence**

The purpose of networks of excellence is to strengthen and develop Community scientific and technological excellence by means of the integration, at European level, of research capacities currently existing or emerging at both national and regional level. Each network will also aim at advancing knowledge in a particular area by assembling a critical mass of expertise. They will foster cooperation between capacities of excellence in universities, research centres, enterprises, including SMEs, and science and technology organisations. The activities concerned will be generally targeted towards long-term, multidisciplinary objectives, rather than predefined results in terms of products, processes or services.

A network of excellence will be implemented by a joint programme of activities involving some or, where appropriate, all of the research capacities and activities of the participants in the relevant area to attain a critical mass of expertise and European added value. A joint programme of activities could aim at the creation of a self-standing virtual centre of excellence that may result in developing the necessary means for achieving a durable integration of the research capacities.

A joint programme of activities will necessarily include those aimed at integration, as well as activities related to the spreading of excellence and dissemination of results outside the network.

Subject to conditions to be specified in the specific programmes and in the rules for participation, the networks of excellence will have a high level of management autonomy including, where appropriate, the possibility to adapt the composition of the network and the content of the joint programme of activities.

1.2. **Integrated projects**

Integrated projects are designed to give increased impetus to the Community's competitiveness or to address major societal needs by mobilising a critical mass of research and technological development resources and competences. Each integrated project should be assigned clearly defined scientific and technological objectives and should be directed at obtaining specific results applicable in terms of, for instance, products, processes or services. Under these objectives they may include more long-term or 'risky' research.

Integrated projects should comprise a coherent set of component actions which may vary in size and structure according to the tasks to be carried out, each dealing with different aspects of the research needed to achieve common overall objectives, and forming a coherent whole and implemented in close coordination.

The activities carried out as part of an integrated project should include research and, as appropriate, technological development and/or demonstration activities, activities for the management and use of knowledge in order to promote innovation, and any other type of activity directly related to the objectives of the integrated project.

Subject to conditions to be specified in the specific programmes and in the rules for participation, the integrated projects will have a high level of management autonomy including, where appropriate, the possibility to adapt the partnership and the content of the project. They will be carried out on the basis of overall financing plans preferably involving significant mobilisation of public and private sector funding, including funding or collaboration schemes such as Eureka, EIB and EIF.

1.3. **Specific targeted research or innovation projects**

Specific targeted research projects will aim at improving European competitiveness. They should be sharply focused and will take either of the following two forms, or a combination of the two:

(a) a research and technological development project designed to gain new knowledge either to improve considerably or to develop new products, processes or services or to meet other needs of society and Community policies;

(b) a demonstration project designed to prove the viability of new technologies offering potential economic advantage but which cannot be commercialised directly.

Specific targeted innovation projects are designed to test, validate and disseminate new innovation concepts and methods at the European level.

1.4. **Specific research projects for SMEs**

Specific research projects for SMEs may take either of the following forms:

(a) cooperative research projects undertaken for the benefit of a number of SMEs on themes of common interest;

(b) collective research projects carried out for industrial associations or industry groupings in entire sectors of industry where SMEs are prominent.

1.5. **Actions to promote and develop human resources and mobility**

Actions to promote and develop human resources and mobility will be targeted at training, development of expertise or transfer of knowledge. They will involve support to actions carried out by natural persons, host structures, including training networks, and also by European research teams.

1.6. **Coordination actions**

Coordination actions are intended to promote and support the coordinated initiatives of a range of research and innovation operators aiming at improved integration. They will cover activities such as the organisation of conferences, meetings, the performance of studies, exchanges of personnel, the exchange and dissemination of good practices, setting up information systems and expert groups, and may, if necessary, include support for the definition, organisation and management of joint or common initiatives.

1.7. **Specific support actions**

Specific support actions will complement the implementation of this programme and may be used to help in preparations for future Community research and technological development policy activities including monitoring and assessment activities. In particular, they will involve conferences, seminars, studies and analyses, high level scientific awards and competitions, working groups and expert groups, operational support and dissemination, information and communication activities, or a combination of these, as appropriate in each case. They may also include actions in support of research infrastructure relating to, for instance, transnational access or preparatory technical work (including feasibility studies) and the development of new infrastructure.

1.8. **Integrated infrastructure initiatives**

Integrated infrastructure initiatives should combine in a single action several activities essential to reinforce and develop research infrastructures, in order to provide services at the European level. To this end, they should combine networking activities with a support activity (such as relating to transnational access) or research activities needed to improve infrastructure performance, excluding, however, the financing of investment for new infrastructures, which can only be financed as specific support actions. They will include a component of dissemination of knowledge to potential users, including industry and in particular to SMEs.

1.9. **Participation of the Community in programmes undertaken by several Member States (Article 169)**

Pursuant to Article 169 of the Treaty, this instrument will cover clearly identified programmes implemented by governments, national or regional authorities or research organisations and may be used in all the activities of this programme. The joint implementation of these programmes will entail recourse to a specific implementation structure. This may be achieved by means of harmonised work programmes and common, joint or coordinated calls for proposals.

2. **Detailed rules for financial participation by the Community**

The Community will implement the financial instruments in compliance with the Community framework for State aid to research and development, as well as international rules in this area, and in particular the WTO Agreement on Subsidies and Countervailing Measures. In compliance with this international framework, it will need to be possible to adjust the scale and form of financial participation under this programme 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 and EIF.

In the case of participation of bodies from regions lagging in development, when a project receives the maximum intensity of co-financing authorised under this programme or an overall grant, an additional contribution from the Structural Funds, pursuant to Council Regulation (EC) No 1260/1999 of 21 June 1999 laying down general provisions on the Structural Funds [1], could be granted.

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.

In the case of participation of organisations from Mediterranean or developing countries, a contribution of the MEDA programme and of the financial instruments of the Community's aid to development could be envisaged.

Financial participation by the Community will be granted in compliance with the principle of co-financing, with the exception of financing for studies, conferences and public tenders.

Financial participation by the Community will, except in duly justified cases, be decided following open calls for proposals or invitation to tender procedures. Selection of projects will be based on independent peer review.

The Commission will carry out the research activities in such a way as to ensure the protection of the Community's financial interests by means of effective controls and, if irregularities are detected, by means of dissuasive and proportionate penalties.

In the decisions adopting the specific programmes implementing this programme, there can be no derogations from the rules set out in the table below.

RTD ACTIVITIES AND COMMUNITY FINANCIAL CONTRIBUTION ACCORDING TO TYPE OF INSTRUMENT

Type of instrument	RTD activities	Community contribution (*) [1]
Networks of excellence	— Priority thematic areas — Policy support and anticipating scientific and technological needs	Grant for integration: maximum of 25 % of the value of the capacity and resources proposed for integration by participants as a fixed amount to support the joint programme of activities [2]
Integrated projects	— Priority thematic areas — Policy support and anticipating scientific and technological needs	Grant to the budget of a maximum of — 50 % for research — 35 % for demonstration — 100 % for certain other activities such as training of researchers and consortium management [3] [4]
Specific targeted research or innovation projects	— Priority thematic areas — Policy support and anticipating scientific and technological needs — Specific international cooperation activities — Promoting interaction between research and innovation — Developing harmonious relations between science and society	Grant to the budget of a maximum of 50 % of the budget [3] [4]
Participation in programmes undertaken by several Member States (Article 169)	— All activities of the sixth framework programme	To be defined in subsequent decisions taken on the basis of Article 169

[1] OJ L 161, 26.6.1999, p. 1.

Type of instrument	RTD activities	Community contribution (*) [1]
Specific research projects for SMEs	— Specific research activities for SMEs	Grant to the budget of a maximum of 50 % of the budget [3] [4]
Actions to promote and develop human resources and mobility	— Promotion of human resources and mobility	Grant to the budget of a maximum of 100 % of the budget [3], if necessary as a lump sum.
Coordination actions	— In all the activities of the sixth framework programme	Grant to the budget of a maximum of 100 % of the budget [3].
Specific support actions	— In all the activities of the sixth framework programme	Grant to the budget of a maximum of 100 % of the budget [3] [6], if necessary as a lump sum
Integrated infrastructure initiatives	— Support for research infrastructures	Grant to the budget: depending on the type of activity, of a maximum of 50 % to 100 % of the budget [3] [4] [5]
Direct actions	— Non-nuclear activities of the Joint Research Centre	100 % [7]

(*) In this column budget means a financial plan estimating all the resources and expenditure needed to carry out the action.

(1) As a general principle, the Community financial contribution cannot cover 100 % of the expenditure of an indirect action with the exception of proposals covering a purchase price governed by the terms applicable to public procurement procedures or taking the form of a pre-defined lump sum pre-set by the Commission.

However, the Community financial contribution may bear up to 100 % of the expenditure of an indirect action if they complement those otherwise borne by the participants. Also, in the specific case of coordination actions, it covers up to 100 % of the budget necessary for the coordination of activities funded by the participants themselves.

(2) This rate varies for different areas.

(3) Subject to specific conditions specific legal entities, particularly public bodies, will receive funding of up to 100 % of their marginal/additional cost.

(4) The rates of assistance may be differentiated in accordance with the rules of the Community framework for State aid for research and development depending on whether activities relate to research (maximum 50 %) or demonstration (maximum 35 %) or to other activities implemented, such as training of researchers (maximum 100 %) or the management of the consortium (maximum 100 %).

(5) The activities of an integrated initiative relating to infrastructure must include one networking activity (Coordination action: maximum 100 % of the budget) and at least one of the following activities: research activities (maximum 50 % of the budget) or specific service activities (specific support action, for example, transnational access to research infrastructures: maximum 100 % of the budget).

(6) For actions in support of research infrastructure relating to preparatory technical work (including feasibility studies) and the development of new infrastructure, sixth framework programme participation is restricted to maximum of 50 % and 10 % of the budget respectively.

(7) In addition, the JRC will be entitled to participate in indirect actions on the same basis as entities established in Member States.

STATEMENT OF THE COUNCIL'S REASONS

I. INTRODUCTION

1. On 5 March 2001, the Commission submitted its proposal for a European Parliament and Council Decision concerning the sixth multiannual framework programme of the European Community for research, technological development and demonstration activities aimed at contributing towards the creation of the European Research Area (2002 to 2006) ([1]). It subsequently submitted a modified proposal on 23 November 2001 ([2]).

2. This proposal is based on Article 166(1) of the EC Treaty.

3. The Economic and Social Committee delivered its opinion on 11 July 2001 ([3]). The Committee of the Regions was consulted.

4. The European Parliament delivered its opinion on the proposal on 14 November 2001 ([4]).

5. The Council adopted its Common Position on the sixth framework programme of the European Community for research, technological development and demonstration activities, contributing to the creation of the European Research Area and to innovation (2002 to 2006) on 28 January 2002, in accordance with Article 251 of the Treaty ([5]).

II. BACKGROUND AND AIM OF THE PROPOSAL

(a) Pursuant to Title XVIII of the EC Treaty (Articles 163 to 173), the Community will carry out activities on research and technological development. In particular:

— pursuant to Article 163(1) TEC, the Community shall have the objective of strengthening the scientific and technological bases of Community industry and encouraging it to become more competitive at international level, while promoting all the research activities deemed necessary by virtue of other Chapters of this Treaty,

— pursuant to Article 165(1) TEC, the Community and the Member States shall coordinate their research and technological development activities so as to ensure that national policies and Community policy are mutually consistent,

— pursuant to Article 166(1) TEC, all research and technological development activities of the Community shall be set out in a multiannual framework programme (the current fifth framework programme expires in 2002).

(b) The European Councils in Lisbon in March 2000, Santa Maria de Feira in June 2000 and Stockholm in March 2001 adopted conclusions aimed at the rapid establishment of a European research and innovation area (ERA) with a view to the EU becoming the world's most competitive and dynamic knowledge-based economy capable of sustainable economic growth, with more and better jobs and greater social cohesion by 2010.

([1]) At the same time, the Commission submitted a proposal for a Council Decision concerning the sixth multiannual framework programme of the European Atomic Energy Community (Euratom) for research and training activities aimed at contributing towards the creation of the European Research Area (2002 to 2006), based on Article 7 of the Euratom Treaty (OJ C 180, 26.6.2001).

([2]) See Doc. 14565/01 RECH 162 ATO 102 CODEC 1263.

([3]) OJ C 260, 17.9.2001, p. 3.

([4]) See Doc. 13818/01 CODEC 1164 RECH 141.

([5]) The Council has also reached a political agreement on the text of the Council Decision concerning the sixth framework programme of the European Atomic Energy Community (Euratom) for research and training activities, also contributing to the creation of the European Research Area (2002 to 2006). The final adoption of this Decision will take place simultaneously with the final adoption of the EC framework programme Decision. The draft text has been transmitted to the European Parliament for information.

On this basis, the Commission has proposed that the sixth framework programme should, in addition to fulfilling the objectives laid down in the Treaty, contribute to the Lisbon process by helping to make a reality of ERA and enabling open coordination, so that appropriate cooperation in S/T research activities is undertaken at national and European levels.

The essential characteristics of the Commission proposal are, therefore, as follows:

— concentration on a selected number of research areas in which Community action can add the greatest possible value,

— definition of the various activities in such a way as to enable them to exert a more structuring effect on the research activities conducted in Europe thanks to a stronger link with national, regional and other European initiatives,

— simplification and streamlining of the implementation arrangements, on the basis of improved decentralised management procedures.

III. **ANALYSIS OF THE COMMON POSITION**

A. GENERAL OBSERVATIONS

The Council's Common Position reflects to a considerable extent both the proposal of the Commission and the opinion of the European Parliament as regards the structure, scientific and technological content, means of implementation of the framework programme as well as the financial amount and its indicative breakdown. During its examination of the Commission's proposal, the Council sought to incorporate to the largest possible extent the amendments of the European Parliament, to reflect the considerable degree of consensus between the two legislative bodies, while at the same time respecting the general thrust of the Commission's proposal. To this end, the Council has followed certain guiding principles:

1. recognition of the role of the framework programme as an instrument for achieving major Community objectives, bearing in mind that the bulk of European research and technological development efforts are funded by the Member States at national level;

2. the need for a focused Community research effort bringing about a critical mass of expertise and European added value, while ensuring sufficient in-depth coverage of relevant topics under the themes chosen for Community research;

3. the need to complement the focused effort on key thematic research areas by providing flexible support to Community policies and by enabling a response to emerging scientific and technological needs in the rapidly evolving research environment, while setting appropriate parameters for such flexibility so as to ensure legal clarity;

4. the need to implement the framework programme using instruments which are apt to achieve the critical mass of expertise and European added value in the research activities, while ensuring a smooth transition from the fifth framework programme and safeguarding the possibility for all interested parties/entities to participate in Community research, provided the criterion of scientific excellence is fulfilled;

5. the need for clarity, in particular by providing the necessary level of detail, both in terms of S/T content and funding, bearing in mind that the framework programme must be implemented through specific programmes which will, by their very nature, provide for more detailed implementing modalities.

B. SPECIFIC COMMENTS

1. ***Main amendments to the Commission proposal***

(a) **Ethical issues**

Concerning ethical issues, the Council has agreed to the inclusion of references to a number of relevant international instruments on which to base the ethical evaluation of framework programme activities. However, in view of the recent and rapid developments, in particular in the field of biotechnology, as well as ongoing discussions, including those taking place in the European Parliament and at the national level, the Council found it inappropriate to establish, at this stage, a list of research topics to be excluded from Community funding. Nevertheless, the Council is committed to examining this issue in greater depth, where appropriate, with the European Parliament.

(b) **Scientific and technological content**

While broadly maintaining the Commission's proposal on the scientific and technological content of the thematic priorities, the Council, in the light of the European Parliament's amendments, clarified and extended the scope of certain of them as follows:

— in the first priority (genomics and biotechnology for health), fundamental research on genomics has been extended to cover all organisms, in recognition of the fact that useful applications, including those for human health, could arise from basic genomics research on a wide range of organisms. In addition, concerning the medical applications of genomics research, it was found appropriate at this stage to proceed in a broader way and therefore provide an open-ended list of diseases to be covered with particular mention of diabetes, diseases of the nervous system, as well as of cardiovascular and rare diseases.

In response to concerns expressed by the European Parliament, a broader, non-genomics related approach has been accepted with regard to cancer, with a focus on the development of patient-oriented strategies from prevention to diagnosis and treatment,

— the sixth priority (sustainable development, global change and ecosystems). By building upon the amendments proposed by the European Parliament, this priority has been restructured to cover sustainable energy systems, sustainable surface transport, as well as global change and ecosystems, so as to achieve a more comprehensive approach to the theme of sustainability under the three subpriorities chosen. The links between the sixth priority and sustainable management of Europe's natural resources have also been strengthened,

— the activities in support of Community policies and anticipating scientific and technological needs (the 'eighth priority') have been clarified in terms of their complementarity to the thematic priorities as well as the criteria for the selection and implementation of activities.

(c) **Instruments**

The Council has recognised the potential of the new instruments (networks of excellence and integrated projects) for bringing about a critical mass of expertise and European added value as well as for streamlining the management of the framework programme. Accordingly, the Council agreed that they should be used, from the outset of the framework programme, in each theme, and where deemed appropriate, as a priority means. However, in view of the untried nature of these instruments, and the European Parliament's amendment concerning the concept of 'Stairway of excellence', the Council has maintained provisions for the more traditional instruments which have proved their worth during the fifth framework programme, namely targeted research projects and coordination actions. An independent evaluation of the use of the instruments is provided for, and this will subsequently be taken into account during the implementation of the programme.

Concerning the use of Article 169, i.e. participation by the Community in programmes undertaken by several Member States, originally proposed by the Commission as one of the main means of implementation of the thematic priorities, the Council, given the fact that this Article has so far never been applied, and in line with the European Parliament's views, considered that this could be used initially in a limited number of pilot projects on a case-by-case basis. The Council's Common Position therefore refers to the possibility of using Article 169 in all the framework programme activities to cover clearly identified national/regional programmes. The Council awaits with interest the proposals that the Commission will submit to the European Parliament and Council, under the terms of Article 169, for the implementation of this article.

Given the importance attached to the question of the instruments during the discussions on the sixth framework programme it was considered appropriate to include an exhaustive list of all instruments and the modalities of their application, including the Community's financial contribution, as foreseen in Article 166(1) of the Treaty.

(d) **Overall amount and breakdown of funds**

The Council's Common Position maintains the Commission's proposal for the maximum overall amount of EUR 16 270 million, in accordance with the European Parliament's opinion [1]. The Council has however proposed adjustments to the breakdown of this figure, which by and large fall between the figures proposed by the Commission and those suggested by the European Parliament:

— The Council has increased the funding for the thematic priorities, in particular the first (genomics and biotechnology) and the sixth (sustainable development) as well as the fifth (food quality and safety). This acknowledges the extension of activities under these headings, especially in respect of the commitment of the Community to combat climate change and ensure a sustainable environment and health policy,

— the Council also increased the funds for the fourth priority (aeronautics and space), in consideration of its Europe-wide dimension, its high degree of integration and its potential for improving European competitiveness in the international market,

— given the increased allocation to the thematic priorities, reductions were found to be appropriate in the following areas: 'policy support and anticipating emerging needs' (Section 1.2.1, bearing in mind that the Common Position also provides for exploratory research under the thematic priorities), 'support to research infrastructures' (Section 2.3, with very limited financial support for new infrastructures, but with EUR 200 million earmarked for Géant and GRID) and 'coordination of research activities' (Section 3.1),

— in respect of the funding for 'policy support and anticipating emerging needs' the Council considered that, following considerable clarification as to the content of this activity, it constitutes an essential element of the framework programme and also counterbalances the more focused approach in the thematic priority areas, while providing the necessary flexibility within the framework programme to meet new and emerging needs. As a result this area suffered a relatively smaller reduction than that foreseen by the European Parliament,

[1] At the same time, the Council has reached an agreement on the budget of EUR 1 230 million for the Euratom framework programme, resulting in the total of EUR 17 500 million for the EC and Euratom framework programmes, thereby maintaining the total amount for the two framework programmes as proposed by the Commission.

— the funding dedicated to the development of high speed communications networks (Géant and GRID) was increased to EUR 300 million overall, while maintaining the division between the related research activities (to be carried out under thematic priority 2: EUR 100 million) and the infrastructure activities (to be carried out under Section 2.3: EUR 200 million). Accordingly, the budget allocation for research infrastructures was maintained at a higher level than that suggested by the European Parliament,

— concerning the thematic priority of citizens and governance (Section 1.1.7) and the activity on science and society (Section 2.4), the Common Position essentially maintains the Commission's original budget allocations (however, with EUR 10 million increase to 'science and society'), which are lower than those suggested by the European Parliament. In so doing, the Council wished to emphasise the importance of the research work carried out under the first six thematic priorities which it considered essential to attain the fundamental EC Treaty objective of 'strengthening the scientific and technological bases of Community industry and encouraging it to become more competitive at international level'. The Council moreover considered that socioeconomic aspects should be taken into account throughout the activities of the framework programme rather than being dealt with in isolation,

— concerning the activities of the Joint Research Centre (JRC) and their division between non-nuclear and nuclear activities in the EC and Euratom framework programmes respectively, the Council has taken the view that the area of measurements and standards, originally proposed by the Commission under the Euratom programme, is of considerable relevance to ERA and therefore more suited to being incorporated into the EC framework programme. The Common Position accordingly envisages a EUR 40 million increase for JRC non-nuclear activities ([1]).

(e) **Other issues**

In order to improve the legal clarity of the text, the Council introduced a number of modifications of a more technical nature. For instance, Article 6 of the Commission proposal concerning the participation of non-member countries was deleted. This matter does not fall within the scope of the decision on the framework programme (Article 166(1)). Instead the conditions for participation by entities established in non-member countries will be elaborated in the Rules for Participation, in accordance with Article 167 of the Treaty. Subsequent decisions, notably the association agreements, will also deal with this issue.

2. ***Council's position on the European Parliament's amendments***

The Council's Common Position incorporates a large number of the European Parliament's amendments (255 of the 340 amendments suggested), in whole, in substance or in part, sometimes in a modified form or in a different place, and often in the form proposed by the Commission in its modified proposal.

In particular it should be noted that, in line with the Commission's amended proposal, the Common Position incorporates the European Parliament's amendments concerning the extension of activities under the thematic priorities, provided that this approach is compatible with the need to ensure a focusing and integrating effect. As a result certain European Parliament amendments have accordingly been incorporated, not in the thematic priorities, but under Section 1.2.1 of the Common Position (supporting policies), as well as under Heading 3 (coordination activities).

([1]) This increase mirrors an equivalent decrease in the nuclear activities of the JRC under the Euratom framework programme. This reassessment of the JRC activities also facilitates a EUR 50 million increase for fusion research (from 700 proposed by the Commission to 750 million) envisaged by the Council in response to the European Parliament's request of EUR 800 million for fusion research, while maintaining the total Euratom budget at EUR 1 230 million as proposed by the Commission.

(a) The Council's Common Position incorporates the following amendments, in whole or in substance:

— 1, 2, 3, 4, 9, 10, 35, 41, 43, 44, 49, 51, 58, 71, 92, 102, 104, 107, 112, 151, 168, 180, 187, 270, 275, 276, 300, 302, 315, 325, 331, 336, 338.

(b) The Council incorporated in principle, or in part, the following amendments:

— 6, 7, 8 ([1]), 11, 13, 15, 17, 19, 22 (see chapter III.B.1.a), 23, 24, 27, 30, 33, 37, 38, 40, 42, 48, 52, 53, 56, 57, 59, 61, 63, 64, 65, 66, 68, 69, 70, 72, 73, 74, 75, 76, 77, 78, 80, 81, 82, 85, 86, 87, 88, 89, 91, 93, 94, 95, 96, 97, 98, 101, 103, 105, 108, 109, 111, 115, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 131, 134, 135, 136, 138, 140, 143, 146, 147, 148, 149, 152, 153, 154, 155, 156, 157, 158, 160, 161, 162, 164, 165, 166, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 181, 182, 183, 186, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 259, 260, 262, 263, 269, 271, 272, 273, 277, 278, 279, 280, 281, 282, 283, 287, 288, 289, 291, 292, 293, 294, 295, 296 (see chapter III.B.1.d), 297, 298, 299, 305, 308, 309, 312, 314, 316, 320, 321, 322, 323, 324, 326, 327, 328, 329, 332, 333, 334, 335, 337, 339 (see chapter III.B.1.e).

(c) The Council followed the Commission in not incorporating the following amendments:

— 5, 12, 16, 18, 20, 25, 26, 28, 29, 31, 39, 45, 50, 54, 55, 60, 62, 67, 79, 83, 84, 90, 99, 106, 110, 113, 114, 116, 117, 129, 130, 132, 133, 137, 139, 141, 142, 144, 145, 150, 159, 163, 167, 184, 185, 188, 199, 243, 244, 255, 256, 257, 258, 264, 265, 266, 267, 268, 274, 284, 285, 286, 290, 301, 303, 304, 306, 307 (see chapter III.B.1.d), 310, 311, 313, 317, 319, 330, 340.

(d) Regarding certain other amendments not incorporated, the Council's views were as follows:

amendment 14 (compatibility with the financial perspective): it was considered self-evident that the framework programme would respect the ceilings contained in the financial perspectives;

amendment 21 (assigning separate budget lines for specific programmes in the Community budget): the Council considered that the framework programme decision was inappropriate for including such provisions;

amendment 32 (developing understanding of nature and society): it was considered that this was implicitly covered in all aspects of framework programme research; in addition, the thematic priority 7 on citizens and governance explicitly addresses the societal issues;

amendment 34 (innovation activities by SMEs and very small firms): already broadly covered in Annex I, in the Introduction to Heading 1; the concept of 'very small firms' was considered to be covered under 'SMEs';

amendment 36 (management structure): while the Council accepts the European Parliament's views on the need to ensure a high quality of management in implementing the framework programme, it considered it more appropriate to establish the management structure in the specific programmes;

([1]) The Council also adopted on 10 December 2001 a resolution addressing certain issues relating to researchers' mobility, referred to in this amendment. (OJ C 367, 21.12.2001, p. 1).

amendments 46, 47: the Council deleted the text in the Commission's proposal which these amendments related to, as they contained references to activities in third countries, considered inappropriate in a Community legal text;

amendment 100 (anti-personnel mine clearance): this is already listed as a task for JRC (Section 1.3);

amendment 261 (reference to defence and security policy): this is outside the scope of the EC Treaty; however, in Section 1.2.1, reference is made to crisis management and biosecurity;

amendment 318 (financial contribution to 'Article 169' programmes): the Council preferred not to fix the modalities for the implementation of Article 169, pending future Commission proposals for activities to be carried out under this Article.