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(Acts whose publication is obligatory)

DECISION No 182/1999/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 22 December 1998

concerning the fifth framework programme of the European Community for research, technological development and demonstration activities (1998 to 2002)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 130i(1) thereof,

Having regard to the proposal from the Commission [1],

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

Having regard to the opinion of the Committee of the Regions [3],

Acting in accordance with the procedure laid down in Article 189b of the Treaty [4] and in the light of the joint text approved by the Conciliation Committee on 25 November 1998,

(1) Whereas, in accordance with Articles 130f(3) and 130i(1) of the Treaty, a multiannual framework programme covering all Community activities in the field of research and technological development including demonstration activities, hereinafter referred to as RTD, should be adopted;

(2) Whereas it has been considered appropriate to adopt a new framework programme for the period 1998 to 2002 in order to ensure continuity of Community research;

(3) Whereas, in accordance with Article 4(2) of Decision No 1110/94/EC of the European Parliament and of the Council of 26 April 1994 concerning the fourth framework programme of the European Community activities in the field of research, technological development and demonstration (1994 to 1998) [5], the Commission is required to have an external assessment conducted into the management of and progress with Community activities carried out during the five years preceding the assessment, prior to presenting its proposal for a fifth framework programme; whereas that assessment, the conclusions thereof and the Commission's comments have been communicated to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions;

(4) Whereas, in accordance with Article 130f(1) of the Treaty, the Community's research and technological development policy should address, as a matter of priority, problems of society, improving the international competitiveness of Community industry, sustainable development, job creation, the quality of life and globalisation of knowledge, contributing to the development and implementation of the Community's policies and

[1] OJ C 173, 7.6.1997, p. 10, and OJ C 291, 25.9.1997, p. 15.
[2] OJ C 355, 21.11.1997, p. 38, and OJ C 73, 9.3.1998, p. 133.
[3] OJ C 379, 15.12.1997, p. 26.
[4] Opinion of the European Parliament of 18 December 1997 (OJ C 14, 19.1.1998, p. 171), Council Common Position of 24 March 1998 (OJ C 178, 10.6.1998, p. 49) and Decision of the European Parliament of 17 June 1998 (OJ C 210, 6.7.1998, p. 131). Decision of the European Parliament of 15 December 1998 and Decision of the Council of 22 December 1998.

[5] OJ L 126, 18.5.1994, p. 1. Decision as last amended by Decision No 2535/97/EC (OJ L 347, 18.12.1997, p. 1).

the role of the Community in the world as a focal point of scientific and technological excellence;

(5) Whereas appropriate steps should be taken to promote cooperation and coordination between Member States;

(6) Whereas the RTD activities undertaken in the context of the first activity referred to in Article 130g of the Treaty should focus on a limited number of topics; whereas those activities, in the context of indirect actions, should be implemented through 'key actions', which bring together the activities (ranging from basic research through applied and generic research to development and demonstration) in a coherent whole in order to target them strategically on a common European challenge or problem; research and technological development activities of a generic nature; and activities designed to encourage the optimum use of research infrastructures and improve access thereto;

(7) Whereas the activities undertaken in the context of the second (cooperation with third countries and international organisations), third (dissemination and optimisation of RTD results) and fourth (training and mobility of researchers) activities referred to in Article 130g of the Treaty should complement, support and interact with each other and the abovementioned RTD activities;

(8) Whereas this approach presupposes that the potential for scientific and technological excellence existing within the Community is maintained and reinforced, whilst taking full account of the efforts made by its main international partners;

(9) Whereas it is appropriate, in this same context, to place special emphasis on the needs of small and medium-sized enterprises (SMEs), so as to promote their effective participation in Community programmes and their ability to benefit from them; on the dissemination and transfer of results; on innovation; and on the training and mobility of researchers, thereby encouraging the emergence of a new generation of enterprising researchers with innovative ideas;

(10) Whereas research and technological development can stimulate economic growth and, as a result, lead to the creation of lasting employment;

(11) Whereas researchers, industry and users have contributed substantially to the definition of actions to be undertaken in the fifth framework programme and should be involved in its implementation;

(12) Whereas the formulation and implementation of the Community's policies and actions must take into account objectives related to economic and social cohesion; whereas, in accordance with this principle, the framework programme must contribute to the harmonious development of the Community while encouraging RTD activities of high quality; whereas it is therefore necessary to respect the complementary roles of RTD activities and the action undertaken by the Community through other relevant instruments;

(13) Whereas it is necessary to promote and facilitate the participation of ultraperipheral regions in Community RTD actions through appropriate mechanisms adapted to their particular situation;

(14) Whereas, in accordance with the principles of subsidiarity and proportionality as enshrined in Article 3b of the Treaty, the objectives of Community research and technological development policy reflected in the fifth framework programme warrant activities at Community level in so far as the objectives cannot be sufficiently achieved by the Member States; whereas there is a need to establish a 'critical mass' in human and financial terms, in particular through the combination of the complementary expertise and resources available in the various Member States; whereas these objectives can therefore be better achieved at Community level; whereas this Decision does not go beyond what is necessary to achieve these objectives;

(15) Whereas the Community's financial participation in the actions of the framework programme may, in accordance with the principles set out in this framework programme, be varied at the level of the specific programmes according to the nature of the activities concerned and the proximity to the market, in specific and duly justified cases and in compliance with the provisions of the Community framework for State aid for research and development [1], in particular points 5.12 and 5.13 thereof, and with international rules;

[1] OJ C 45, 17.2.1996, p. 5.

(16) Whereas the maximum overall amount of the fifth framework programme would need to be revised should new Member States accede before the framework programme expires;

(17) Whereas Community participation in the framework programme should correspond to the financial perspective in force for the whole period of the programme; whereas account should be taken of the fact that a new financial perspective will be negotiated during the course of the fifth framework programme; whereas, if the maximum overall amount were inconsistent with the amount available for research within the financial perspective then in force, or if there were no financial perspective in force, it would be necessary to decide on a new amount under the conditions provided for in the Treaty; whereas there should be equivalent arrangements for the specific programmes; whereas, in the absence of such arrangements, the specific programmes could not be implemented since they would have been deprived of a legal base for the expenditures which they foresee;

(18) Whereas the administrative expenditure arising from research activities has to be financed within the general amount allocated to the framework programme and should be included in the budget in a transparent fashion;

(19) Whereas the criteria which have been laid down to choose the topics covered by the fifth framework programme and the related scientific and technological objectives take into account the abovementioned principles; whereas those criteria should also be applied when the fifth framework programme is implemented, in order to ensure consistency;

(20) Whereas the Joint Research Centre (JRC) will implement direct RTD actions through research and scientific and technical support activities of an institutional character where it has special or even unique expertise and facilities in the Community or where it is entrusted with activities necessary for the framing and implementation of Community policies and tasks incumbent on the Commission pursuant to the Treaty which require the JRC's impartiality; whereas in addition, it will participate progressively in a competitive approach, as a member of consortia, in carrying out research activities foreseen by way of indirect actions;

(21) Whereas it is necessary to take into account the ethical aspects of advances in knowledge and technologies and their application and to conduct research activities in compliance with fundamental ethical principles and with the protection of privacy;

(22) Whereas the Community equal opportunities policy must be taken into account in implementing the fifth framework programme whereas, therefore, participation of women in the field of RTD should be encouraged;

(23) Whereas, in addition to the annual report to be submitted to the European Parliament and the Council pursuant to Article 130p of the Treaty, arrangements should be adopted, in accordance with recommendations to be implemented in respect of transparency and sound and efficient management, for the systematic examination of the progress of the fifth framework programme and its evaluation;

(24) Whereas the European Parliament, as one of the decision-making bodies for future research programmes, intends to follow the progress of the framework programme during its implementation by the Commission, while not impinging on or constraining the Commission's implementation role;

(25) Whereas a *modus vivendi* between the European Parliament, the Council and the Commission concerning the implementing measures for acts adopted in accordance with the procedure laid down in Article 189b of the Treaty [1] was concluded on 20 December 1994;

(26) Whereas it is necessary to reinforce the phasing-in within the framework Programme, in accordance with the eligibility criteria, of certain coal and steel research activities currently being carried out on the basis of the Treaty establishing the European Coal and Steel Community, which expires in 2002;

(27) Whereas, in order to ensure consistency between research activities undertaken under the Treaty establishing the European Community and those carried out under the Treaty establishing the European Atomic Energy Community, the Decision concerning the framework programme for nuclear research and training activities should be adopted at the same time and for the same period as this framework programme;

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[1] OJ C 102, 4.4.1996, p. 1.

(28) Whereas the Scientific and Technical Research Committee (CREST) has been consulted,

HAVE DECIDED AS FOLLOWS:

Article 1

1. A multiannual framework programme for all Community activities, including demonstration activities, in the field of research and technological development, hereinafter referred to as the 'fifth framework programme', is hereby adopted for the period 1998 to 2002.

2. The fifth framework programme shall, in accordance with Article 130g of the Treaty, comprise four Community activities:

(a) implementation of research, technological development and demonstration programmes;

(b) promotion of cooperation in the field of Community research, technological development and demonstration with third countries and international organisations;

(c) dissemination and optimisation of the results of activities in Community research, technological development and demonstration;

(d) stimulation of the training and mobility of researchers in the Community.

The first Community activity shall relate to the following four themes:

1. quality of life and management of living resources;

2. user-friendly information society;

3. competitive and sustainable growth;

4. energy, environment and sustainable development.

The second, third and fourth Community activities shall relate to the following three themes respectively:

1. confirming the international role of Community research;

2. promotion of innovation and encouragement of participation of SMEs;

3. improving human research potential and the socioeconomic knowledge base.

Activities undertaken within the thematic programmes of the first Community activity will also contribute, in coordination and interaction with the horizontal programmes, to the achievement of the objectives of those three themes.

Complementarity with relevant initiatives of the Member States, and initiatives such as COST and Eureka, will be sought.

3. The criteria for selecting the themes referred to in paragraph 2 and the related objectives are set out in Annex I. They shall apply for the purposes of the implementation of the fifth framework programme.

4. The general outlines of the Community activities, their scientific and technological objectives and the related priorities are set out in Annex II.

Article 2

1. (a) The maximum overall amount for Community participation in the fifth framework programme shall be ECU 13 700 million.

Of this amount:

to ECU 3 140 million is for the period 1998 to 1999,

to ECU 10 560 million is for the period 2000 to 2002.

(b) The figure of ECU 10 560 million shall be deemed to be confirmed if it is consistent with the financial perspective in force in the period 2000 to 2002. In the case of any new financial perspective in force, this condition shall be met only if:

— the financial perspective indicates the share of expenditure available for research, and

— that share permits Community participation of ECU 10 560 million in the period 2000 to 2002.

(c) If the figure of ECU 10 560 million is not consistent with the financial perspective in force in the period 2000 to 2002, or if there is no financial perspective in force in those years,

— the European Parliament and the Council, acting under the conditions provided for in Article 130i(1) of the Treaty, shall set a new maximum overall amount and adjust the amounts in Annex III accordingly,

— the Council, acting under the conditions provided for in Article 130i(4) of the Treaty, shall adapt the amounts deemed necessary for the specific programmes referred to in Article 3, so as to ensure their consistency with the new maximum overall amount.

Pending the decisions provided for in the first and second indents above, the specific programmes shall not be implemented beyond the provision in the first indent of subparagraph (a) of this paragraph.

2. The amount referred to in paragraph 1 shall be subject to revision should new Member States accede before this framework programme expires.

3. Annex III fixes the respective amounts earmarked for each of the Community activities envisaged in Article 1 and indicates the breakdown between the themes of the first Community activity defined in Article 1(2).

4. All administrative expenditure arising from the research activities shall be paid from the overall amount of the programme. It shall be dealt with in the general budget of the European Communities according to the usual procedures applicable to other comparable administrative expenditure.

Article 3

1. The fifth framework programme shall be implemented through eight specific programmes, four of which correspond to the four themes of the first Community activity, three are linked to the second, third and fourth Community activities respectively, and the eighth is a programme specific to the Joint Research Centre. The scientific, industrial and user communities will be closely involved throughout this implementation process.

Each specific programme shall specify its precise objectives having regard to the scientific and technological objectives set forth in Annex II, define the detailed rules for its implementation, fix its duration and provide for the means deemed necessary.

The Commission will establish and publish under its own responsibility a detailed manual of operational procedures and guidelines for the selection of research and technological development actions.

2. Implementation of the fifth framework programme may give rise, where necessary, to supplementary programmes within the meaning of Article 130k of the Treaty, to Community participation in research and development programmes undertaken by several Member States within the meaning of Article 130l or to the setting-up of joint undertakings or any other structure within the meaning of Article 130n. It may also give rise to cooperation with third countries or international organisations within the meaning of Article 130m.

Article 4

The detailed rules for financial participation by the Community in the fifth framework programme shall be those laid down in accordance with the special provisions concerning research and technological development appropriations set out in the Financial Regulation applicable to the general budget of the European Communities [1], as supplemented by Annex IV to this Decision.

Article 5

1. The Commission shall continually and systematically monitor each year, with the help of independent qualified experts, the implementation of the fifth framework programme and its specific programmes in the light of the criteria set out in Annex I and the scientific and technological objectives set out in Annex II. It shall assess, in particular, whether the objectives, priorities and financial resources are still appropriate to the changing situation. Where appropriate, it shall submit proposals to adapt or supplement the framework programme and/or the specific programmes, taking account of the results of this assessment.

2. Before submitting its proposal for a sixth framework programme, the Commission shall have an external assessment conducted by independent highly qualified experts into the implementation and achievements of Community activities carried out during the five years preceding that assessment in the light of the criteria set out in Annex I, the scientific and technological objectives set out in Annex II and the implementation of this Decision via the specific programmes based thereon. The Commission shall communicate the conclusions thereof, accompanied by its comments, to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions.

3. The independent qualified experts referred to in paragraphs 1 and 2 shall be drawn in particular from scientific, industrial and user communities and chosen by the Commission, which shall take account, in a balanced fashion, of the various research players.

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[1] OJ L 356, 31.12.1977, p. 1. Regulation as last amended by Regulation (EC, ECSC, Euratom) No 2548/98, OJ L 320, 28.11.1998, p. 1.

The Commission shall make known the full list of experts and their individual qualifications following their appointment.

4. The Commission shall regularly inform the European Parliament and the Council of the overall progress of the implementation of the framework programme and the specific programmes.

Article 6

Halfway through the term of the fifth framework programme, the Commission shall review progress with the programme and shall submit to the European Parliament and tho the Council, on the basis of the assessments of the various specific programmes, a communication accompanied, if appropriate, by a proposal for the adaptation of this Decision.

Article 7

All research activities conducted pursuant to the fifth framework programme shall be carried out in compliance with fundamental ethical principles, including animal welfare requirements, in conformity with Community law.

Done at Brussels, 22 December 1998.

For the European Parliament	*For the Council*
The President	*The President*
J.M. GIL-ROBLES	C. EINEM

ANNEX I

CRITERIA FOR SELECTING THE THEMES AND OBJECTIVES OF COMMUNITY ACTIVITIES

1. The European Community's RTD policy is directed towards 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 the Treaty. It shall also contribute to promoting the quality of life of the Community's citizens and to the sustainable development of the Community as a whole, including the ecological aspects. Its implementation is based on the twin principles of scientific and technological excellence and relevance to the abovementioned objectives.

   Moreover, in pursuit of a cost-benefit approach dictated by concern for optimum allocation of European public funding and in accordance with the subsidiarity principle, themes for the fifth framework programme and the related objectives are selected on the basis that the Community shall take action only if and in so far as the objectives cannot be sufficiently achieved by the Member States.

2. In application of the foregoing principles, the framework programme shall be defined on the basis of a set of common criteria, divided into three categories:

   — *Criteria related to the Community 'value added' and the subsidiarity principle*

      — need to establish a 'critical mass' in human and financial terms, in particular through the combination of the complementary expertise and resources available in the various Member States,

      — significant contribution to the implementation of one or more Community policies,

      — addressing of problems arising at Community level, or questions relating to aspects of standardisation, or questions connected with the development of the European area,

   so as to select only objectives which are more efficiently pursued at the Community level by means of research activities conducted at that level.

   — *Criteria related to social objectives*

      — improving the employment situation,

      — promoting the quality of life and health,

      — preserving the environment,

   in order to further major social objectives of the Community reflecting the expectations and concerns of its citizens.

   — *Criteria related to economic development and scientific and technological prospects*

      — areas which are expanding and create good growth prospects,

      — areas in which Community businesses can and must become more competitive,

      — areas in which prospects of significant scientific and technological progress are opening up, offering possibilities for dissemination and exploitation of results in the medium or long term,

   in order to contribute to the harmonious and sustainable development of the Community as a whole.

3. The criteria referred to in paragraph 2 will be used, and where necessary supplemented, for the purposes of the implementation of the fifth framework programme, in order to define the specific programmes and select research and technological development activities, including demonstration activities. The three categories of criteria will supply simultaneously and must all be met, although to a different extent from case to case.

ANNEX II

GENERAL OUTLINES OF COMMUNITY ACTIVITIES, SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES AND RELATED PRIORITIES

I. THEMES AND ORGANISATION

With regard to the themes and organisation of the fifth framework programme, it is recalled that, in accordance with Article 130g of the EC Treaty, the fifth framework programme will comprise four activities:

— the first activity covers research, technological development and demonstration programmes,

— the second activity is aimed at promoting cooperation on research, technological development and demonstration with third countries and international organisations,

— the third activity concerns the dissemination and optimisation of the results of research, technological development and demonstration activities,

— the fourth activity is intended to stimulate the training and mobility of researchers.

1. CONTENT AND ORGANISATION OF THE FIRST ACTIVITY

The research, technological development and demonstration programmes will comprise:

— 'key actions',

— research and technological development activities of a generic nature,

— activities in support of research infrastructures.

These programmes will, where appropriate, include studies and research activities on relevant ethical and legal aspects, within a context of fundamental respect for human values. Community funding for research projects unter this programme will be used exclusively for civil purposes, including research on the detection and clearance of landmines.

Within these programmes, particular account will be taken of the socioeconomic implications of the implementation, use, and effects of the technologies, processes and scenarios covered by each of these programmes. As an integral part of actions within the first activity, relevant socioeconomic research will be carried out. A particular effort will be made to ensure coherence between these activities in order to optimise the exploitation and dissemination of results by users. These actions will be complemented by socioeconomic research on horizontal issues carried out within the fourth activity.

Particular account will be taken of the need to encourage the participation of women in the fields of research and technological development.

In addition, in the framework of a coherent approach involving also the second, third and fourth activities, these programmes will implement, in their respective areas, actions contributing to the aims of these activities.

A particular effort will be made to encourage genuine participation of SMEs in the programme, especially in shared-cost actions.

Synergy will be sought with other relevant Community instruments.

(a) *'Key actions'*

Key actions will be problem-oriented and clearly defined corresponding to the criteria and specifically targeted to the objectives of each programme and to the desired results, taking into account the views of users. They will have a clear European focus. The 'key action' is regarded as a cluster of small and large, applied, generic and, as appropriate, basic research projects directed towards a common European challenge or problem not excluding global issues.

The research activities carried out in this context will integrate the entire spectrum of activities and disciplines needed to achieve the objectives, and range from basic research through development to demonstration. Appropriate links with relevant national and international initiatives (including complementary European RTD frameworks) will be given proper attention.

(b) *Research and technological development activities of a generic nature*

These activities, which are essential to achieve the objectives of the thematic programmes, will be carried out in a limited number of areas not covered by the key actions. They will complement the key actions. Their main aim is to help the Community maintain and improve its scientific and technological capability in those areas of research and enabling technologies which should be used widely.

(c) *Support for research infrastructures*

Since the construction and operation of research infrastructure is the responsibility of national authorities, Community support for research infrastructures in line with the objectives of the thematic programmes should contribute to cover two essential requirements at Community level: (1) the need for an optimum use of existing research infrastructures and (2) the need for transnational cooperation in the rational and cost-effective development of research infrastructures.

The role of the Community should be to provide added value, complementary to national or multinational initiatives. Community support may enhance access to infrastructures and will in particular be provided for research infrastructure networks leading to further complementarity, pooling of efforts and/or specialisation at the European level (including the compatibility of databases).

2. CONTENT AND ORGANISATION OF THE SECOND, THIRD AND FOURTH ACTIVITIES

The horizontal themes are at the crossroads of the Community's research policy and its policies for external relations, innovation, SMEs and human resources, and for social and employment issues.

Each of them comprises:

— specific activities, including, where necessary, key actions, linked to the general objectives of the Community's policy with regard to external relations, innovation, SMEs and human resources which are not carried out as part of the themes of the first activity,

— activities essentially in the form of coordination, support and accompanying activities to ensure the coherence of equivalent activities carried out under the themes of the first activity.

In coordination and interaction with the horizontal programmes, the thematic programmes will take the necessary measures to make an active contribution, in the context of their own activities, towards the achievement of the general objectives of the horizontal programmes.

Community support for research infrastructures in the context of the fourth activity will concentrate in particular on measures enhancing access to such infrastructures.

3. THE JOINT RESEARCH CENTRE

The direct RTD actions to be implemented by the Joint Research Centre (JRC) will comprise research and scientific and technical support activities of an institutional character. The JRC may provide support where it has special or even unique expertise and facilities in the Community or where it is entrusted with activities necessary for the framing and implementation of Community policies and tasks incumbent on the Commission pursuant to the Treaty which require the JRC's impartiality (for example in the case of standardisation). The JRC will carry out its activities in close cooperation with the scientific community and enterprises in Europe. Exchanges between the JRC and universities, research institutes and industry will be encouraged.

The JRC is also progressively involved in competitive activities.

The appropriations made available to the JRC constitute a maximum amount. In addition, the JRC may endeavour to secure funds from other sources. The relevant JRC management rules and regulations will apply to these allocations.

II. SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES

1. FIRST ACTIVITY

THEME 1

QUALITY OF LIFE AND MANAGEMENT OF LIVING RESOURCES

Improving the quality of life and health is a major challenge and the Community plans to tackle it by helping to increase knowledge and develop technologies in the field of the life sciences.

In this context, the need is to improve the quality of life of all Europe's citizens, taking into account the particular problems of certain sectors of the population such as the ageing and the disabled.

At the same time, progress in this area will help to increase the competitiveness of the Community's enterprises by opening up new prospects in areas in which the Community already has a strong hand, such as biotechnology, agro-industry, and the fields of health and the environment, in which rapid progress continues to be made.

(a) *Key actions*

(i) Food, nutrition and health

The aim of this key action is to promote the development of knowledge, technologies and methods, including prenormative aspects, based on multidisciplinary approaches to produce a safe, healthy, balanced and varied food supply for consumers covering the whole food chain. This requires as a priority:

— the development of safe, flexible and new and/or improved manufacturing technologies to improve food quality and consumer acceptability, while guaranteeing traceability of raw materials and final products,

— the development of tests to detect and processes to eliminate infectious and toxic agents throughout the food chain,

— research into the role of food in promoting and sustaining health with respect to diet and nutrition, toxicology, epidemiology, environmental interaction, consumer choice and public health.

(ii) Control of infectious diseases

The priority objectives of this key action are the fight against and control of infectious diseases, both human and animal, including zoonoses, of increasing impact, whether established, newly emerging or in resurgence, based on research seeking a better understanding of the immune system. Close attention is to be paid to:

— the development of improved or novel mono-component, multipurpose and combined vaccines, especially against viral diseases, including the support of multicentre clinical trials,

— new and improved strategies to identify and control infectious diseases, directed at treatment and prevention and based on studies on pathogenesis, emergence of resistance and immunological control,

— aspects connected with public health and care delivery systems, notably management, prevention, surveillance, behavioural aspects and response to infectious diseases (including modelling of human diseases).

(iii) The 'cell factory'

This key action is aimed at helping the Community's enterprises to exploit the advances made in life sciences and technologies, particularly in the fields of health, environment, agriculture, agro-industries and high value-added products, such as chemicals. It is aimed at developing multidisciplinary technologies based on the exploitation of the properties of micro-organisms, plants and animals, in particular at the cellular and sub-cellular levels. The objective is to understand the functioning of cells in order to develop bio-molecules and bio-processes with high added-value capable of enhancing the quality of life and health, including:

— new and innovative health processes and products, particularly from molecular engineering (for example diagnostics, antibiotics, anti-cancer agents, including plant-produced therapeutics),

— energy-efficient bio-remediation and waste bio-treatment processes,

— new biological processes and products, new processing technologies on the basis of new plant and animal characteristics for agri-food and agri-industry and high value-added chemical applications.

This key action should also aim at RTD to make cell cultures available as models for medicine, pharmacology, toxicology and environmental monitoring to substitute for animal testing and for prenormative purposes.

(iv) Environment and health

The aim of this key action is to achieve a better understanding of the interactions between the genetic, physiological, environmental and social factors involved in sustaining good health and so to help reduce the adverse impact on health of changes in the environment and the workplace and the immense costs to health systems arising therefrom. It covers in particular issues such as prevention and the effects on health of air pollution, heavy metals and toxic substances, noise, climatic changes and electromagnetic radiation, as well as the effects of pollution at the workplace. It includes as a priority:

— multidisciplinary approaches for achieving a better understanding of the interaction between the social and physical environment and health, including research into diseases and allergies related to or influenced by the environment and research into their treatment and prevention,

— epidemiological studies and pathogenesis research,

— the development of new methods of diagnosis, risk assessment and prevention,

— the development of processes to identify and, where possible, reduce harmful effects on health and the causes thereof.

(v) Sustainable agriculture, fisheries and forestry, including integrated development of rural areas

The aim is to develop the knowledge and technologies needed for the production and exploitation of living resources, including forests, covering the whole production chain, adapted to recent adjustments in the common agricultural and fisheries policies, whil also providing the scientific basis for Community regulations and standards. Similarly, the aim is to promote the multipurpose role of forests and the sustainable management and utilisation of forest resources as an integral factor of rural development. Priority areas include:

— new and sustainable systems of production, including breeding methods, and exploitation in agriculture, forestry, fishing and aquaculture, taking into account profitability, the sustainable management of resources, product quality and employment as well as animal health and welfare,

— the integrated production and exploitation of biological materials (non-food uses),

— sustainable and multipurpose utilisation of forest resources; the integrated forestry-wood chain,

— development of methods of control, surveillance and protection, including protection of land and prevention of soil erosion,

— prelegislative research designed to provide a scientific basis for Community legislation,

— the production of new tools and models for the integrated and sustainable development of rural and other relevant areas based on optimisation of the specific potential of each area, including at regional level, diversification of activities and land use, and involvement of the people concerned.

(vi) The ageing population

This key action aims to help Europe meet the challenge of the growing ageing population through RTD to underpin the development of policies and interventions to extend the quality of life and independence of older people, and to reduce the need for long-term care and its consequential costs. It gives priority to multidisciplinary RTD relating to processes leading to healthy ageing, including demographic, social and economic aspects, and to interventions leading to the postponement and improved management of disability. It aims to generate competitive advantage for a wide range of health related industries and sectors. Priority areas include:

— RTD on illnesses and health problems of high morbidity [1] which are age-related and where there is a real prospect for significant prevention, treatment or delay in onset,

— RTD concerning biological, psychological, social and economic determinants of healthy ageing and of the mechanisms leading to disability and the postponement of disability,

— demographic and epidemiological research on ageing and disability trends to enable prediction of the size and nature of the ageing population as a basis for policy and planning,

— RTD to provide a basis for new approaches to delaying the onset of disability, to reducing the challenge to older people of their social and physical environment (e.g. in housing and transport) and to supporting mental and physical functioning,

— RTD concerning effective and efficient delivery of health and social care services to older people, including comparative research on the financing of long-term care and pensions.

(b) *Research and technological development activities of a generic nature*

— Chronic and degenerative diseases (in particular cancer and diabetes), cardiovascular diseases and rare diseases

Major challenges in biomedical research are the elucidation of the aetiology and pathogenesis of diseases for which there is more than one interacting cause (genetic, environmental, lifestyle) of high (e.g. cardiovascular diseases, cancer, diabetes) or low (e.g. rare diseases) morbidity. There is an urgent need to improve diagnosis, treatment, prevention and surveillance through epidemiology and applying advances in modern technology, requiring a multinational approach,

— Research into genomes and diseases of genetic origin

The aim of this activity is to identify the physiological functions of genes and to improve the understanding of the meaning of sequence information. The new knowledge and technologies deriving from this generic action should promote the exploitation of genomic information to

[1] Long and serious illness, entailing a high burden on society, families, individuals and their carers.

the benefit of European health, industry and the environment. The organisation of collaboration in this area will underpin the development of expression systems to facilitate the study of genes of industrial and agronomic interest as well as the design of effective molecular and gene-based preventive and therapeutic strategies for human and animal disease,

— Neurosciences

This activity should provide new insights and understanding of the mechanisms governing the interrelationship of biological and psychological processes, to promote new diagnostic (e.g. imaging) and therapeutic approaches to neurological and psychiatric disorders and to underpin opportunities for innovation in health-care industries,

— Research relating to public health and health services

Improvement of health systems: to improve the health of European citizens and the effectiveness and cost-effectiveness of health promotion and health-care technologies and interventions, to enhance health and safety at work, to evaluate health-care models, to develop the evidence base for clinical practice and health policy and to study health variations across Europe.

Fighting drug-related problems: to prevent and, where appropriate, control drug-related health problems through establishing the psychological and socioeconomic factors involved in drug-taking and drug abuse, developing better understanding of the long-term health and social consequences of abuse, and developing more effective treatment strategies,

— Research relating to the disabled

The aim of this activity is to enhance the quality of life and independence of disabled people, notably through improving their social and physical environment and the effective and efficient delivery of the health and social care services available to them.

— The study of problems relating to biomedical ethics and bioethics in the context of respect for fundamental human values [1],

— The study of the socioeconomic aspects of development of the life sciences and technologies within the perspective of sustainable development (impact on society, the economy and employment)

(c) *Support for research infrastructures*

In accordance with the general objectives outlined above, activities should focus, for example, on databases and collections of biological material, centres for clinical research and trials and facilities for fishery and aquaculture research.

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[1] Taking account of the declaration of the European Council of Amsterdam and the European Parliament resolution on the banning of human cloning (OJ C 115, 14.4.1997, p. 92) and of relevant Community legislation, research conducted at Community level will be carried out, taking account of the competent authorities, in particular the European Group on Ethics in Science and New Technologies and the Human Embryo and Foetus Protection Group, as well as the opinions of relevant international organisations, whilst respecting the principles laid down in the Helsinki Declaration and the relevant resolutions of the World Health Organisation (WHO) and in other relevant international Conventions.
No research activity which modifies or is intended to modify the genetic heritage of human beings by alteration of germ cells or by acting at any other stage in embryonic development and which can make such alteration heritable will be carried out under the present framework programme. In the same way, no research activity, understood in the sense of the term 'cloning', will be conducted with the aim of replacing a germ or embryo cell nucleus with that of the cell of any individual, a cell from an embryo or a cell coming from a late stage of development to the human embryo.
To the extent possible, animal experiments and tests on animals should be replaced with *in vitro* or other alternative methods. Modification of the genetic heritage of animals and animal cloning will be envisaged within the current framework programme only for objectives which are justified on ethical grounds and to the extent that the operations involved are effected on an ethical basis, with respect for the well-being of animals and the principles of genetic diversity.
(The practical effects of this will be further elaborated in the specific programmes).

THEME 2

USER-FRIENDLY INFORMATION SOCIETY

The convergence between information processing, communications and content is increasingly pervading most industrial and social activities and is increasingly critical to Europe's competitiveness and quality of life. The advent of the information society is opening up the possibility of a wide range of new activities for both individuals and companies in the Community, e.g. in the fields of commerce, work, transport, the environment, education and training, health and culture. Continuous efforts in relation to research, technological development and technology take-up and demonstration are necessary to realise the full potential of the information society. The technological range of the key actions allows the possibility of a dynamic concentration and a flexible implementation of the activities, reflecting socioeconomic priorities.

These efforts must, in all activities, tackle the universal issues such as access, ease of use, cost-effectiveness and interoperability and standardisation. They should also address the socioeconomic impact of the activities, in particular the social changes brought about by the introduction and more widespread use of new information and communications technologies, including their effect on different population groups, with particular attention to their effect on women and young people. Tackling the issues of access and ease of use in this context shall be an important priority.

(a) *Key actions*

(i) Systems and services for the citizen

The aim of this key action is to meet policy and user needs and to ease access at the lowest cost to quality general-purpose services, boost the industry providing these services and pave the way to 'digital communities' both in rural and urban areas. In this context, it will be based on the following priorities:

— as regards health: on computerised clinical systems, on secure high-capacity health networks and telemedicine,

— as regards persons with special needs, including the disabled and the elderly: on advanced interfaced and on telesystems to integrate the elderly and the disabled into society,

— as regards public administration: advanced multimedia systems to facilitate access to and provision of services of public interest,

— as regards the environment: on intelligent systems for analysis, surveillance, management and early warning and support systems for the detection and clearance of landmines,

— as regards transport and tourism: on the advanced intelligent systems needed for management and associated teleservices.

(ii) New methods of work and electronic commerce

The aim of this key action is to develop technologies to help companies operate more efficiently and to make commerce in goods and services more efficient, and to facilitate improvements in working conditions and the quality of work. The priority topics will be:

— flexible, mobile and remote working methods and tools for individuals and for cooperative and group working and working methods based on simulation and virtual reality — including related training,

— management systems for suppliers and consumers, including systems supporting mass-customisation and interoperable and secure payment systems,

— information and network security, including cryptography, techniques for combating computer crime, the technical means for authentication and the protection of integrity and intellectual property and 'privacy enhancing technologies'.

(iii) Multimedia content and tools

The aim of this key action is to facilitate lifelong learning, to stimulate creativity, to enable linguistic and cultural diversity and to improve the functionality of future information products and services, taking account of user-friendliness and acceptability. The research emphasises intelligent systems for education and training with innovative forms of multimedia content, including audiovisual content, and tools for structuring and processing them. It will focus on four main lines:

— interactive electronic publishing with new methods for creating and structuring publications; personalised dissemination of information and accessing scientific, cultural and other items through networking of libraries, archives and museums,

— education and training: systems, services and software enabling the development and demonstration of new methods using multimedia, broadband communications, simulation and virtual reality,

— new language technologies, including interfaces, which help to make information and communications systems more user-friendly,

— advanced technologies for accessing, filtering, analysing and handling information to help manage the information explosion and facilitate the use of multimedia contents, including geographical information systems.

(iv) Essential technologies and infrastructures

The aim of this key action is to promote excellence in the technologies which are crucial to the information society, to speed up their introduction and broaden their field of application. This action will focus as a matter of priority on:

— technologies for and management of information processing, communications and networks, including broadband ones, together with their implementation, interoperability and application,

— technologies and engineering for software, systems and services, including high-quality statistics,

— real-time and large-scale simulation and visualisation technologies,

— mobile and personal communications and systems, including satellite-related systems and services,

— interfaces making use of the various senses,

— peripherals, subsystems and microsystems,

— micro-electronics (technologies, tools, equipment and hardware necessary for the design and manufacture of circuits and components and the development of applications).

(b) *Research and technological development activities of a generic nature*

In order to develop from a visionary perspective future and emerging technologies with a potential industrial impact, research topics could include, in a non-prescriptive way:

— technologies for the representation, creation and handling of knowledge,

— nano-scale, quantum, photonic, bio-electronic technologies, including future generation integrated circuits, ultra-high performance computers and super-intelligent networks.

(c) *Support for research infrastructures*

The priority is to provide support to facilitate the rapid implementation and interoperability of Europe-wide advanced high-speed computer and communication systems needed for research in all fields of science and technology, in the context of the global evolution of the Internet.

THEME 3

COMPETITIVE AND SUSTAINABLE GROWTH

The objective is to produce and disseminate the knowledge and technologies needed to design and develop processes and produce high-quality, environment- and consumer-friendly products which will be competitive on tomorrow's market, to help increase growth and create new jobs in Europe and to sustain the continuing innovation effort of manufacturing firms (including SMEs) so as to improve their competitiveness.

This goes hand in hand with the development of transport systems which are economic, safe, and protective of the environment and quality of life.

(a) *Key actions* [1]

(i) Innovative products, processes and organisation

The aim of this key action is to facilitate the development of high-quality innovative products and services which meet the needs of the citizen and the market and new methods of production and manufacture, including innovation in and modernisation of traditional industries, which save resources and are environmentally safe, whatever the method of production. Research will focus as a matter of priority on:

— the elaboration, development and integration of new technologies for design, manufacturing, control and production, including micro- and nano-scale technologies and engineering,

— deployment, integration and adaptation of information society technologies for intelligent manufacturing (including flexible workshop systems and systems for flexible management of supply and distribution chains, embedded systems and teleservices for operation and maintenance and simulation and shared-work technologies),

— technologies to improve quality control and for clean and eco-efficient processes, including synthesis and separation techniques, aiming at reducing resource utilisation and promoting the use of renewable resources, reuse and recycling of waste and the development of clean processes and products based on the concept of 'life-cycle analysis',

— new methods of organising production and work and of using and developing skills (including socioeconomic analyses), also in traditional industries.

(ii) Sustainable mobility and intermodality

The aim is to ensure the development of fully integrated policy and operational options for an integrated interoperable European rail and road, air and waterborne transport system on a broadly intermodal basis to ensure the mobility of people and goods, while at the same time improving transport efficiency, safety and reliability and reducing congestion and other environmental disbenefits. This requires as a matter of priority:

— the development, validation and demonstration of rational modal and intermodal transport management systems, including better use of second-generation satellite navigation and positioning systems, and advanced traveller and operator information services,

— research into transport infrastructures and their interfaces with transport means and systems, while reducing any adverse environmental and safety impacts and taking account of accessibility and the integration of regional planning and transport policies,

— the development of technical and socioeconomic scenarios for the sustainable mobility of people and goods.

[1] Coordination will be ensured between the various key actions and generic technologies on rail and road transport means.

(iii) Land transport and marine technologies

The aim is to encourage, while preserving the environment and improving safety, the development and integration of knowledge and technologies specific to land transport and sea-based activities. It will enable the Community to develop technologies to maintain and consolidate the competitive position of the European automotive and rail industry by developing innovative technologies and new materials, modes and systems for sustainable and efficient land transport means and to fully exploit the sea's potential and improve the competitiveness of marine industry. This action will be complementary to the key actions on sustainable mobility and intermodality and sustainable marine ecosystems. Action will cover as a matter of priority:

— development of technologies for economic, clean, safe, efficient, energy-saving and intelligent road and rail vehicles operating in the total integrated transport environment,

— innovative vehicle concepts using new materials and construction techniques with emphasis on improved safety (including weight reduction and crashworthiness), recyclability and reduction of whole life-cycle costs,

— human/vehicle interaction in road and rail vehicles and innovative methods for the adaptation of rail-based systems to new needs,

— development of advanced ships which are safe, environmentally friendly and efficient,

— the use of the sea and inland waterways as economic and safe means of transporting goods and passengers (including advanced port infrastructure) by maximising vessel performance and interoperability in conjunction with the key action on 'sustainable mobility and intermodality',

— technologies for the study and observation of the seas and sustainable exploitation of the seas' energy and mineral resources, including offshore and subsea technologies, and unmanned vehicles and submarine acoustics.

(iv) New perspectives in aeronautics

The aim of this key action is to help the Community consolidate its position in this sector by developing its mastery, in an environmentally friendly manner, of the most advanced aeronautical technologies. It will cover as a matter of priority:

— the development and demonstration of advanced technologies for integrated design and production, and for reduction of energy consumption, emissions and noise for various aircraft concepts,

— the technological and economic feasibility of and the critical technologies for new-generation aircraft concepts including advanced systems and sub-systems,

— the development of technologies to improve operational safety and efficiency, including on-board integration of air-traffic management technologies, in coordination with other transport-related key actions.

(b) *Research and technological development activities of a generic nature*

The effort will be focused on the priority research needed to reinforce European competitiveness and quality of life:

— by supporting the development of new and improved industrial materials and the processes for their manufacture: materials resistant to high temperatures and high pressure (e.g. for energy generation and engines); light materials (for transport and construction); functional materials (opto-electronics, biomaterials, sensors) designed and developed with ease of recycling in mind; surface and interface engineering, as well as nano-scale and beam technologies,

— by ensuring that European standards and testing laboratories provide consistent measurements and tests which are equivalent to similar measurements made by Europe's major trading partners; by making available technical tests, certified reference materials and measuring instruments for use in Member States in order to assure compliance with Community directives; by supporting standardisation and certification, including action to combat fraud and ensure the quality of products and services,

— by developing new and improved materials and production technologies in the steel field.

(c) *Support for research infrastructures*

In accordance with the general objectives outlined above, activities should focus, for example, on computing centres for research, high-power wind tunnels, laboratories and facilities for measurements and tests, as well as specialised databases.

THEME 4

ENERGY, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

Research and technological development in the field of the environment, energy and the sustainable management of ecosystem resources is essential for the implementation of Union policies. Making use of the knowledge and technologies needed will make it possible to meet a wide range of needs. The results of this research will provide the basis for the framing of policies at Community level or deriving from international treaties.

This objective goes hand in hand with economic development and industrial competitiveness that respects the environment and quality of life. It necessitates clean, efficient, economic and diversified energy systems and services, including the introduction of new and renewable energy technologies. In particular, these should contribute to a substantial reduction in emissions of CO_2 and other greenhouse gases.

Although research and technological development in the field of environment and energy are closely related, they remain distinct areas, each requiring specific financial and administrative arrangements.

1. **Environment and sustainable development**

(a) *Key actions*

(i) Sustainable management and quality of water

The aim of this key action is to produce the knowledge and technologies needed for the rational management of water resources for domestic needs and those of industry and agriculture. Among the priority fields concerned are:

— treatment and purification technologies to prevent pollution, to purify water and to use and/or reuse water rationally (including closed loops; reliability of distribution networks); integrated approach to management of water resources and wetlands,

— technologies for monitoring and preventing pollution and the protection and management of groundwater and surface-water resources, including ecological quality aspects,

— surveillance, early warning and communication systems,

— technologies for the regulation and management of stocks and technologies for arid and semi-arid areas and generally water-deficient regions.

(ii) Global change, climate and biodiversity

The aim of this key action is to develop the scientific and technological basis and tools necessary to underpin implementation of Community policies, notably the EC environmental action programmes and the biodiversity strategy, and to support the research obligations stemming from international treaties and conventions signed by the European Community and its Member States. Overall, the key action seeks to increase understanding in these areas in order to help deliver the Community goal of sustainable development, where possible in interaction with industry. In this context priorities are:

— to understand, detect, assess and predict global change processes, with an emphasis on the European and sub-regional causes and impacts, with respect to both natural and anthropogenic phenomena and in the context of the sustainable use of natural resources. The natural, the socioeconomic and, where relevant, the cultural sciences will be used,

— to foster better understanding of the terrestrial and marine ecosystems and the interactions between them and other ecosystems,

— to develop scenarios and strategies for the prevention and mitigation of and adaptation to global change, climate change and conservation of biodiversity in the context of sustainable development,

— to support the development of a European component of the global observing systems for climate, terrestrial ecosystems (including biodiversity) and oceans (for example, Euro-GOOS).

(iii) Sustainable marine ecosystems

The aim of this key action is to promote sustainable integrated management of marine resources and to contribute to the marine aspects of the fifth action plan on the environment. Synergy with other relevant activities of the framework programme will be ensured through a specific coordinating mechanism.

Research will be directed towards:

— developing the necessary scientific knowledge base on marine processes, ecosystems and interactions for sustainable use of the marine environment and resources,

— reducing the impact of human activity upon the biodiversity and sustainable functioning of marine ecosystems and developing the technologies required to facilitate safe and economic, yet sustainable, exploitation of marine resources,

— monitoring and managing coastal processes in order to alleviate pollution, flooding and erosion, in particular of fragile coastlines, and to facilitate land reclamation from the sea,

— enabling the operational forecasting of environmental constraints on safe sustainable offshore operations, including the necessary components of an appropriate marine observing system.

(iv) The city of tomorrow and cultural heritage

The aim of this key action is the harmonious development of the citizens' urban environment from a global, innovative and resource-saving viewpoint in an environmentally sound manner, using advanced models of organisation bringing together in particular the improvement of the quality of life, the restoration of social equilibria and the protection, conservation and enhancement of the cultural heritage for the sustainable exploitation of its socioeconomic potential for employment and tourism. Action will focus as a matter of priority on:

— new models for the sustainable development of European cities and city regions, the elaboration of medium- and long-term socioeconomic scenarios and research, development and demonstration activities focusing in particular on supporting and accompanying economic competitiveness, town planning and architecture, social integration, safety, energy efficiency and energy saving (in particular in buildings and in urban transport) and information networks (the concept of 'digital cities'),

— development and demonstration of technologies and products for diagnosis, protection, conservation, restoration and sustainable exploitation of the European cultural heritage, focusing on both movable and immovable cultural assets with a view to promoting their value and the quality of life,

— development and demonstration of technologies for economic, clean, effective and sustainable preservation, recovery, renovation and construction, in particular for large groups of buildings,

— comparative assessment and cost-effective implementation of strategies for sustainable transport systems in an urban environment.

(b) *Research and technological development activities of a generic nature*

— the fight against major natural and technological hazards through the development of forecasting, prevention, impact assessment and mitigation techniques,

— the development of generic Earth observation technologies, notably satellite-borne technologies [1] for environmental monitoring and resource and ecosystem management applications,

— the study of the socioeconomic aspects of development of environmental change within the perspective of sustainable development (impact on society, the economy and employment).

(c) *Support for research infrastructures*

In accordance with the general objectives outlined above, activities should focus, for example, on databases, marine-research facilities and computer centres for climate studies.

2. **Energy**

The activities carried out in this area will be closely coordinated, as appropriate, with the activities of the fifth Euratom framework programme for research and training, while respecting the different legal bases of these two programmes.

(a) *Key actions*

(i) Cleaner energy systems, including renewables

The aim of this key action is to minimise the environmental impact of the production and use of energy in Europe. Action will be taken to investigate cleaner, most notably renewable, energy sources, as well as to help reduce the environmental impact of existing fossil fuel use. Work will focus by way of priority on:

— large-scale generation of electricity and/or heat with reduced CO_2 emissions from coal, biomass or other fuels, including combined heat and power,

— development and demonstration, including for the purposes of decentralised generation, of the main new and renewable energy sources, in particular biomass, fuel-cell, wind and solar technologies,

— integration of new and renewable energy sources into energy systems,

— cost-effective environmental abatement technologies for power production.

(ii) Economic and efficient energy for a competitive Europe

The aim of this key action is to provide Europe with a reliable, efficient, safe and economic energy supply for the benefit of its citizens, the functioning of society and the competitiveness of its industry. Action will need to be taken at every stage of the energy cycle — production, distribution and final use — to improve efficiency and reduce costs. Work will focus by way of priority on:

— technologies for the rational and efficient end-use of energy,

— technologies for the transmission and distribution of energy,

— technologies for the storage of energy on both the macro and the micro scales,

— improved exploration, extraction and production efficiency for hydrocarbons,

— improving the efficiency of new and renewable energy sources,

— the elaboration of scenarios on supply and demand in economy/environment/energy systems and their interactions, and the analysis of the cost-effectiveness (based on whole-life costs) and efficiency of all energy sources.

[1] There will be specific coordination of the activities relating to 'space technology' application carried out within each of the thematic programmes.

(b) *Research and technological development activities of a generic nature*

— The study of the socioeconomic aspects of energy within the perspective of sustainable development (impact on society, the economy and employment).

2. SECOND ACTIVITY

HORIZONTAL THEME 'CONFIRMING THE INTERNATIONAL ROLE OF COMMUNITY RESEARCH'

The main purposes of this horizontal theme are to promote scientific and technological cooperation internationally; to reinforce Community capacities in the fields of science and technology; to provide general support for the achievement of scientific excellence within the wider international framework; and to contribute to the implementation of the Community's external policy also with the accession of new Member States in mind.

The general objectives of international scientific cooperation are:

— to promote scientific and technological cooperation between undertakings, organisations and researchers from third countries and from the Community, which is likely to produce significant, mutual and balanced benefits, taking into account the different needs and circumstances of individual groups of countries and regions whilst respecting the protection of intellectual property,

— to facilitate access for research centres and undertakings established in the Community to scientific and technological knowledge available outside the Community which serves the Community's interests,

— to enhance the position and role of Community research in the international scientific and technological arena and promote a European scientific and technological culture,

— to prepare for the accession of new Member States for example by encouraging their full association with the framework programme; to contribute to the stabilisation of the RTD potential of the CEECs in general and of the newly independent States of the former Soviet Union (NIS), to support and develop the Euro-Mediterranean partnership and to contribute to the sustainable economic, social and scientific development of developing countries,

— to help European research players acquire information and gain experience of research capacity, activity and priorities of industrialised third countries and 'emerging economy' countries, so as to make Community industry more competitive and enhance its presence on new markets.

International scientific and technological cooperation will be implemented on the basis of cooperation agreements, where these exist, and through this horizontal international cooperation programme, as well as through activities undertaken within the other programmes of this framework programme.

1. **Specific actions in the 'international cooperation' programme**

On the basis of the cooperation policies in specific areas which the Community pursues with its various potential partners, three categories of action will be implemented with a specific international dimension, linked to specific problems facing these countries and not addressed by the other activities of the framework programme. Only these actions will be financed through the specific 'international cooperation' programme.

(a) *Cooperation with certain categories of third country*

— States in the pre-accession phase: promotion of their centres of excellence, accompanying measures to facilitate participation in the other programmes of the framework programme, including through cooperation networks,

— NIS and CEECs not in the pre-accession phase: support for their research and technological development potential (including through INTAS for the NIS, provided that

a new agreement is reached between its members on its continuation), cooperation in areas of mutual interest (including satellite applications, regional problems linked to the environment and health),

— Mediterranean partner countries: improving through joint activities their RTD capacities and promoting innovation; cooperation in areas of mutual interest, notably regional aspects of the Mediterranean, including environmental aspects, support for socio-economic development, including the urban dimension, transition to the information society and preservation of cultural heritage, accompanying measures to facilitate participation in the other programmes of the framework programme, including through cooperation networks,

— developing countries: a policy dialogue on RTD needs and priorities with groups of countries and regions will be developed. Cooperation activities will be envisaged, in particular in the following areas: mechanisms and conditions for sustainable development; sustainable management and use of natural resources, including agricultural production, environmental and energy aspects; health, nutrition and food security,

— emerging economy and industrialised countries: Exchanges of scientists; organisation of workshops; accompanying measures to promote partnerships and to enhance mutual access to each other's RTD activities including, where appropriate, through scientific and technological cooperation agreements.

(b) *Training of researchers*

A system of fellowships will be set up to give young researchers from developing countries, Mediterranean and 'emerging economy' countries the opportunity of collaborating in laboratories in the Community on specific projects of the framework programme. Another fellowship scheme will be provided for a limited number of young Community researchers so as to enable them to work in industrially-oriented laboratories of the highest quality in third countries in areas of particular interest to the Community.

(c) *Coordination*

Coordination with COST actions, and support for COST administration, coordination with Eureka and with international organisations involved in research activities; coordination of activities pursued through the other programmes of the framework programme — with one another, with those pursued through the Community's other cooperation actions (notably PHARE, TACIS and MEDA) and with the Member States' cooperation activities.

2. **International cooperation pursued through the other framework programme activities**

Participation by entities of third countries in the specific programmes may take basically two forms:

— programme participation based on full association with the framework programme: participation for third-country entities under similar conditions to Member State entities. Full association of States in the pre-accession phase could be facilitated through appropriate degressive financing mechanisms, making use, where so decided, of other relevant Community instruments (e.g. PHARE). For other States in the pre-accession phase which indicate that full participation in the framework programme is not yet feasible for them, partial association with one or more complete specific programmes could be envisaged,

— participation in specific programmes on a project-by-project basis: if a bilateral or a multilateral cooperation agreement is necessary in the Community's interest in order to provide access to high-quality third-country programmes and suitable IPR arrangements, project-by-project participation will be subject to the conclusion of such an agreement. Participating entities of third countries will in principle not benefit from funds under these programmes, except in cases duly justified as being in the Community's interest.

The detailed conditions under which entities from third countries and international organisations involved in research activities may participate in the framework programme, including the financial arrangements, will be specified in the decision which will be adopted pursuant to Article 130j of the Treaty.

3. THIRD ACTIVITY

HORIZONTAL THEME 'PROMOTION OF INNOVATION AND ENCOURAGEMENT OF SME PARTICIPATION'

Innovation is a key factor in industrial competitiveness, sustainable social and economic development and job creation. The aim is to promote innovative activities, including the creation of innovative enterprises, and to facilitate the dissemination and exploitation of research results and support technology transfer.

Small and medium-sized businesses are important vectors and actors in innovation. The development of SMEs can make a vital contribution to economic and social development, new economic activities, job creation and competitiveness. SMEs must therefore be provided with easier access to the advanced technologies which they need, and to the opportunities offered by the Community's as well as the Member States' research programmes.

Promotion of innovation and SME participation, although not synonymous, are closely linked. As far as possible, this theme will therefore be implemented by means of joint action covering both areas. Furthermore, the activities carried out in this programme will be complementary to activities undertaken within Member States and to activities to promote innovation and encourage SME participation carried out elsewhere in the framework programme, and will therefore support, supplement and, as appropriate, give direction to these various efforts.

1. **General objectives**

(a) *Promotion of innovation*

— to help implement innovation policies in the European Union, in particular by contributing to the creation of an environment conducive to innovation,

— to enhance public awareness of the benefits of innovation,

— to improve the economic and social impact of framework programme research activities by ensuring better dissemination and exploitation of their results, as well as the transfer and dissemination of technology from various sources, taking account of the needs of customers and users,

— to facilitate access of programme participants (particularly SMEs), through provision of information and advice, to instruments which support innovation.

(b) *Encouraging SME participation*

— to stimulate SME participation in the research programmes and technology transfer to SMEs — both SMEs active in research and high technology and those with little or no research capability but with substantial technological needs and a capacity to absorb new technologies; to help SMEs throughout the European Union to develop their technological capabilities, taking into account also specific problems of SMEs in less-favoured regions,

— to assist SMEs in setting up transnational networks and partnerships for the absorption and diffusion of new technologies,

— to encourage the development of transnational links between SMEs, large companies, research centres and universities.

2. **Actions specific to the horizontal programme**

(a) *Promotion of innovation*

— identification and dissemination, in concert with the other programmes of the framework programme, of adequate mechanisms to facilitate, in the life-cycle of projects, the exploitation, private financing and transfer of technologies and results produced, while guaranteeing protection of the knowledge acquired,

— development, validation and implementation of methodologies for technology transfer actions integrating the technological, economic and social aspects of innovation and, where necessary, transnational dissemination and exploitation of results not stemming from the thematic programmes (taking account of the particular characteristics of each sector of activity),

— coordination of studies and analyses carried out in various fora and integration of their results, with a view to establishing a common reference framework in the area of innovation policy.

(b) *Encouraging SME participation*

— management of a single complementary entry point for SMEs — for all the research programmes — in the Commission's departments, making use of existing support networks in Member States; definition and management of common tools facilitating SME participation in the programmes (fullest possible use of electronic methods for information dossiers, submission of proposals, 'help line', specialised Intranets to stimulate SME participation in innovation, etc.); provision of information on programmes and training on proposal preparation;

— increasing involvement of SMEs at all stages in the consultation/assessment process; where appropriate, their representative associations may also be consulted; ensuring a structured and rapid feedback system for all applicants; assistance for the establishment of consortia; simplifying procedures and further increasing the efficiency of contract and payment arrangements; and improving transparency,

— permanently open calls for proposals for measures specific to SMEs, such as exploratory awards or cooperative research activities,

— assistance to SMEs in identifying their current and future technological needs and provision of information and advice with a view to meeting those needs.

(c) *Joint actions for innovation/SMEs*

— actions at Community level for the rationalisation and coordination of networks providing information and assistance on the Community's research and innovation activities; management, in concert with the other programmes of the framework programme, of the support network for innovation and technology transfer, making best use of the innovation relay centres and the CRAFT focal points; consolidation of mechanisms for gathering and disseminating information, such as the Cordis information service,

— provision of information and advice, as well as pilot activities, in the areas of:

  — intellectual property rights,

  — access to private finance, notably venture capital funds,

  — the creation of innovative start-ups, principally via European organisations and funds (European Investment Fund, European Investment Bank, and the Eurotech Capital scheme).

  The objective of the pilot activities will be to improve the existing capacities for information, advice and analysis and to facilitate access to existing public and private instruments at national or Community level without providing financial subsidies to enterprises or creating a competing financial instrument;

— identification and promotion, in concert with the other programmes of the framework programmes, of best practices in innovation.

3. **Interaction with related actions in the other framework programme activities**

(a) *Promotion of innovation*

— encouraging preparation for the exploitation and dissemination of results during the research phase,

— ensuring consistency between activities to foster innovation under the other programmes and those carried out in this programme,

— coordination of the activities of the 'innovation units' to be set up under the thematic programmes, with the aim of supplementing the innovation dimension of the implementation of programmes (e.g. in the selection and monitoring of projects) and securing, as appropriate, the follow-up of technology transfer, including technology transfer projects with a demonstration effect.

(b) *Encouraging SME participation*

Support for SME participation in RTD and demonstration activities to be carried out in the programmes:

— 'cooperative research' activities enabling at least three mutually independent SMEs from at least two Member States jointly to seek the resolution of their common technological problems internally or by entrusting it to third legal entities with appropriate research capacities,

— activities to support and encourage SME participation in collaborative and cooperative research projects (for example on the basis of 'exploratory awards' respecting the needs of SMEs for a flexible and easily accessible support system.

Support for ensuring and improving dissemination and exploitation of results within the thematic programmes.

4. FOURTH ACTIVITY

HORIZONTAL THEME: 'IMPROVING HUMAN RESEARCH POTENTIAL AND THE SOCIOECONOMIC KNOWLEDGE BASE'

The world is increasingly based on knowledge. The Community's prime asset in this area is the quality of its researchers, engineers and technicians. The aim is to preserve and help develop this knowledge potential through greater support for the training and mobility of researchers and by enhancing access to research infrastructures.

The Community also has a solid tradition of research in social and economic science and the humanities, which needs to be mobilised to identify economic and social trends and requirements, both current and future, in order to contribute to the Community's competitiveness and the quality of life of its citizens.

1. **General objectives**

The general objectives of this activity, to be realised in concert with related actions elsewhere in the framework programme, are centred on two main areas of activity, namely improving the human research potential and strengthening the socioeconomic knowledge base. To this end, actions will be undertaken:

— to develop the Community's human research potential, making special efforts to ensure equality of access and a better balance between men and women, notably through the training and mobility of researchers so as to contribute, *inter alia*, to efforts for creating new jobs,

— to enhance access to research infrastructures,

— to help make the Community an attractive location for researchers and to promote European research in the international arena and to promote a European scientific and technological culture,

— to strengthen, through a specific key station, the socioeconomic knowledge base for a better understanding of key problems facing European society,

— to help develop scientific and technological policies and other Community policies.

2. **Actions specific to the horizontal programme**

(a) *Improving human research potential*

Supporting training and mobility of researchers

Actions will cover:

— the establishment of research training networks on high-quality projects, including those in emerging fields of research, on topics freely chosen by the researchers. The accent will be placed on the training and development of young researchers at pre-doctoral and at post-doctoral level,

— the establishment of a coherent system of 'Marie Curie' fellowships centred on individual fellowships for young high-quality researchers with the necessary research experience, awarded for topics chosen by the researchers themselves.

Additional and complementary schemes include:

— industrial host fellowships awarded to, and jointly funded by, enterprises (including SMEs) for the training of young researchers,

— development host fellowships to help develop high-level research capacity in the less favoured regions of the Community,

— experienced researchers' fellowships to promote mobility between industry and academia,

— support for short stays by doctoral students at training sites.

Enhancing access to research infrastructures

The main aim is to enhance access to research infrastructures (large facilities, networks of distributed facilities, infrastructural centres of competence) to the extent that such measures are not undertaken by other activities of the framework programme. To this end, measures are envisaged to help researchers with transnational access to infrastructures which are of Community-wide interest on account of their rarity and/or specialisation, including, where relevant, complementary measures to support the setting up of networks between infrastructure operators and related research projects.

Promoting scientific and technological excellence

The objective here is to stimulate, through exchange, scientific and technological excellence and to make the most of the achievements of research. Activities will build on and complement national activities and will include support for high-level scientific conferences, the networking of Community researchers active outside the Community with their Community colleagues, distinctions for high-level research work, including a European Descartes prize awarded to researchers for outstanding scientific and technological

achievements resulting from European collaborative research, and actions to raise public awareness and making information on important scientific issues available to the public at Community level, including via electronic networks.

(b) *Key action: improving the socioeconomic knowledge base*

The aim of this key action is to define the base for employment-generating social, economic and cultural development and for building a European knowledge society. It covers a number of subjects linked to the general objectives of the framework programme. Work will focus on:

— analysing structural, demographic and social changes, including the phenomena of xenophobia, racism and migration in Europe, and their impact on economic development, social integration and social protection,

— the relationship between technological development, employment and society, including working conditions and workforce skills and on innovation in education and training, including for newly emerging professions,

— analysing the changing role of European institutions, systems of governance and citizenship in the process of European integration, taking account of the impact of culture, the media and the social and legal environment,

— validating new development models, fostering growth, employment, social and economic cohesion and the quality of life, taking account of the development of services and the non-tangible economy.

(c) *Other activities will be undertaken in support of the development of science and technology policies.*

The aim is to support the development of the specific knowledge base needed by policy-makers and other users on European science and technology policy issues. Building on and complementing national and international activities, this action will cover the development of appropriate and comparable indicators, technology watch and assessment, strategic analysis of specific policy issues and, where appropriate, promotion of exchange of information and experience between policy-makers and researchers.

3. **Interaction with related actions in the other framework programme activities**

This activity will include the coordination, support and accompanying actions needed to ensure consistency with actions undertaken elsewhere in the framework programme on the aspects related to the objectives and activities of this programme. The programme will also ensure, through appropriate monitoring and coordinating mechanisms, the adequate incorporation of socioeconomic and strategic considerations into the research activities of the thematic programmes.

ANNEX III

FIFTH FRAMEWORK PROGRAMME (1998 TO 2002)

AMOUNTS AND BREAKDOWN

	ECU million (current prices)
Indirect actions:	
— First activity	10 843 (1)
— Second activity	475
— Third activity	363
— Fourth activity	1 280
Direct actions (2)	739
Maximum overall amount	13 700
(1) Of which 10 % on average for SMEs. (2) To be carried out by the JRC.	

	(in million ECU)
Indicative breakdown between the themes of the first activity:	
— quality of life and management of living resources	2 413
— user-friendly information society	3 600
— competitive and sustainable growth	2 705
— energy, environment and sustainable development	
— environment and sustainable development	1 083
— energy	1 042
	10 843

ANNEX IV

RULES FOR FINANCIAL PARTICIPATION BY THE COMMUNITY

The Community will contribute financially to the research and technological development activities, including demonstration activities, hereinafter referred to as 'indirect RTD actions', carried out under the specific programmes implementing the framework programme. In addition, it will carry out directly research and development activities in the areas covered by the framework programme, hereinafter referred to as 'direct TRD actions'.

1. **Indirect RTD actions**

The indirect RTD actions will comprise: shared-cost actions, which will be the principal mechanism for implementing the specific programmes, as well as training fellowships, support for networks, concerted actions and accompanying measures.

(a) *Shared-cost actions*

— research and technological development projects, demonstration projects, combined RTD/demonstration projects:

  — research and technological development projects: projects designed to obtain new knowledge likely to be useful either to develop new or significantly to improve existing products, processes and/or services and/or to meet the needs of Community policies,

  — demonstration projects: projects designed to prove the viability of new technologies which offer a potential economic advantage but which cannot be commercialised directly,

  — combined RTD/demonstration projects: projects with both a research and technological development component and a demonstration component,

— enhancing access to research infrastructures:

  In addition to measures in support of research infrastructure within the other indirect RTD actions, support for enhancing access to research infrastructures will be granted towards the additional costs of receiving Community researchers and making facilities available,

— technology stimulation to encourage and facilitate SME participation in RTD activities:

  'cooperative research' projects: projects enabling at least three mutually independent SMEs from at least two Member States to entrust the resolution of their common technological problems to third legal entities with appropriate research capacities jointly.

  'Exploratory awards' to support the exploratory phase of a project. This might consist of feasibility studies, project validation and preparation and partner search, during a period not exceeding 12 months.

(b) *Training fellowships*

Training fellowships are defined in the context of the fourth activity (Marie Curie fellowships). Fellowships awarded under the first, second or fourth activities will provide an allowance for the fellow which will include provision for proper social welfare expenses and a contribution to costs involved in mobility. There will also be a contribution to the eligible costs of the host institution when it is in the Community.

(c) *Support for research training networks and thematic networks*

— research training networks in the context of the fourth activity. Support will be granted towards the additional eligible costs connected with setting up and maintaining the network,

— thematic networks: networks bringing together, for instance, manufacturers, users, universities, research centres, organisations and research infrastructures around a given scientific and technological objective, so as to facilitate coordination of activities and transfer of knowledge. Support will be granted towards the additional eligible costs of coordinating and implementing the network.

(d) *Concerted actions*

Concerted actions will be designed to coordinate RTD projects already in receipt of funding, in order to exchange experience acquired, to expand the research efforts of the various players so as to reach a critical mass, to disseminate results and to inform users.

(e) *Accompanying measures*

Accompanying measures will contribute to the implementation of the specific programmes or the preparation of future activities, with a view to enabling them to achieve their strategic objectives. They will also seek to prepare for or to support other indirect RTD actions. Measures devoted to the commercialisation of products, processes or services, marketing activities and sales promotion are excluded.

The decisions adopting the specific programmes may spell out in more detail the indirect RTD actions described above, supplement them or subject them to additional conditions or limitations.

The rules for the participation of undertakings, research centres and universities in indirect RTD actions and for the dissemination of results will be specified in the Council Decision to be adopted pursuant to Article 130j of the Treaty. Eligible costs will be defined in that Decision and specified in detail in particular in the contracts.

In addition to the direct RTD actions described below, the JRC will progressively compete for funds for the indirect RTD actions of the framework programme.

2. **Direct RTD actions**

The direct RTD actions to be implemented by the Joint Research Centre (JRC) will cover research and scientific and technical support activities of an institutional character. The JRC may provide support where it has special or even unique expertise and facilities in the Community or where it is entrusted with activities necessary for the framing and implementation of Community policies and tasks incumbent on the Commission pursuant to the Treaty which require the JRC's impartiality. The JRC will carry out its activities in close cooperation with the scientific community and enterprises in Europe.

3. **Rates of participation**

In the decisions adopting the specific programmes implementing the fifth framework programme there can be no derogations from the financial participation rates set out below, with the exception of duly justified special cases.

Activity	Rate of framework programme participation
Indirect RTD actions	
RTD projects Demonstration projects Combined RTD/demonstration projects	50 % of the total eligible costs (1) (2) 35 % of the total eligible costs (1) (2) 35 to 50 % of the total eligible costs (1) (2) (3)
Support for access to research infrastructures	Maximum of 100 % of additional eligible costs
'Cooperative research' projects	50 % of the total eligible costs (1)
'Exploratory awards'	75 % of the total eligible costs
Training fellowships	Maximum of 100 % of the additional eligible costs (4)
Research training networks Thematic networks	Maximum of 100 % of additional eligible costs
Concerted actions	Maximum of 100 % of additional eligible costs
Accompanying measures	Maximum of 100 % of the total eligible costs
Direct RTD actions	100 % of the costs

(1) These rates may need to be adjusted in individual cases to comply with the Community framework for State aid for research and development and with Article 8 of the Agreement on subsidies and countervailing measures of the WTO Agreement.
(2) In the special case of legal entities which do not keep analytical accounts, the additional eligible costs generated as a result of the research will be financed at the rate of 100 %.
(3) 35 % for the demonstration part, 50 % for the RTD part.
(4) In the case of industrial host fellowships, this will normally approximate to 50 % of the total eligible costs.

4. **Joint undertakings etc.**

Any Council Decisions taken pursuant to Article 130o, as referred to in Article 3(2) of this Decision, will lay down, where necessary, rules on financial participation by the Community.

STATEMENTS

Statement by the European Parliament, the Council and the Commission re Article 2(1)(b)

The European Parliament, the Council and the Commission interpret the Article 2(1)(b) condition that 'the financial perspective indicates the share of expenditure available for research', as meaning that *a range* would be indicated for the research share.

Statement by the European Parliament, the Council and the Commission re Article 2(1)(c)

In the case referred to in Article 2(1)(c), second indent, the European Parliament, the Council and the Commission undertake to take the necessary steps within their respective competencies to allow for a speedy adoption of the decision fixing the amounts for the specific programmes in consequence of the decision of the European Parliament and the Council

Statement by the Commission re Article 3(1)

The Commission states that it will continue to apply all the relevant interinstitutional arrangements, including transmission to the European Parliament of draft measures and — notably in the case of research — the drafts of work programmes and any updating thereof as well as transmission to the European Parliament of the agendas of committee meetings and the result of votes.

Statement by the Commission re Article 5(1)

The Commission states that the annual monitoring reports will be promptly made available, in accordance with current practice, to the relevant programme committees and to the European Parliament's Committee on research, technological development and energy.

Statement by the Commission re Article 5(2)

The Commission comments will state whether and how the recommendations of the experts are being implemented.

Statement by the Commission re Article 5(3)

The Commission states that experts from the Commission including the JRC shall perform only an advisory role in this assessment process.

Statement by the Commission re Article 5(4)

Regular information on programme implementation will be ensured on the one hand via the programme committees and on the other hand via the European Parliament Committee on research, technological development and energy.

Statement by the Commission re Article 5(4)

The Commission states that, when informing the European Parliament and the Council of the overall progress of the implementation of the Framework Programme and the specific programmes, notably in the annual report established in compliance with Article 130P of the Treaty, it will especially address all relevant aspects of SME participation in the programmes as well as their achievements.

Statement by the Commission re Annex II(I)(3) — the Joint Research Centre

The Commission confirms that the European Parliament may request the Commission to perform research activities to be entrusted to the JRC, within the scope of its scientific and technological priorities.

Statement by the Commission re Annex II(I)(3)

If requested by Parliament, the Commission will give favourable consideration to carrying out research into the legal, financial and practical aspects of extending the RTD activities of the EC Treaty to processing methods and technologies for chemical and bacteriological substances.