

Official Journal

of the European Communities

ISSN 0378-6978

L 64

Volume 42

12 March 1999

English edition

Legislation

Contents

I *Acts whose publication is obligatory*

.....

II *Acts whose publication is not obligatory*

Council

1999/167/EC:

- ★ Council Decision of 25 January 1999 adopting a specific programme for research, technological development and demonstration on quality of life and management of living resources (1998 to 2002) 1

1999/168/EC:

- ★ Council Decision of 25 January 1999 adopting a specific programme for research, technological development and demonstration on a user-friendly information society (1998 to 2002) 20

1999/169/EC:

- ★ Council Decision of 25 January 1999 adopting a specific programme for research, technological development and demonstration on competitive and sustainable growth (1998 to 2002) 40

1999/170/EC:

- ★ Council Decision of 25 January 1999 adopting a specific programme for research, technological development and demonstration on energy, environment and sustainable development (1998 to 2002) 58

Price: EUR 34,50

(Continued overleaf)

EN

Acts whose titles are printed in light type are those relating to day-to-day management of agricultural matters, and are generally valid for a limited period.

The titles of all other acts are printed in bold type and preceded by an asterisk.

1999/171/EC:

- ★ Council Decision of 25 January 1999 adopting a specific programme on confirming the international role of Community research (1998 to 2002) 78

1999/172/EC:

- ★ Council Decision of 25 January 1999 adopting a specific programme for research, technological development and demonstration on promotion of innovation and encouragement of SME participation (1998 to 2002) 91

1999/173/EC:

- ★ Council Decision of 25 January 1999 adopting a specific programme for research, technological development and demonstration on improving the human research potential and the socioeconomic knowledge base (1998 to 2002) 105

1999/174/EC:

- ★ Council Decision of 25 January 1999 adopting a specific programme for research and technological development, including demonstration, to be carried out by means of direct actions for the European Community (1998 to 2002) by the Joint Research Centre 127

1999/175/Euratom:

- ★ Council Decision of 25 January 1999 adopting a research and training programme (Euratom) in the field of nuclear energy (1998 to 2002) 142

1999/176/Euratom:

- ★ Council Decision of 25 January 1999 adopting a specific programme for research and training to be carried out by the Joint Research Centre by means of direct actions for the European Atomic Energy Community (1998 to 2002) 154

II

(Acts whose publication is not obligatory)

COUNCIL

COUNCIL DECISION

of 25 January 1999

adopting a specific programme for research, technological development and demonstration
on quality of life and management of living resources (1998 to 2002)

(1999/167/EC)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 130i(4) thereof,

Having regard to the proposal from the Commission⁽¹⁾,

Having regard to the opinion of the European Parliament⁽²⁾,

Having regard to the opinion of the Economic and Social Committee⁽³⁾,

(1) Whereas by Decision No 182/1999/EC⁽⁴⁾, the European Parliament and the Council adopted the fifth framework programme of the European Community (hereinafter referred to as the fifth framework programme) for research, technological development and demonstration (hereinafter referred to as RTD) activities for the period 1998 to 2002 setting out the general outlines and scientific and technological objectives of the activities to be carried out in the field of quality of life and management of living resources;

(2) Whereas Article 130i(3) of the Treaty stipulates that the framework programme shall be implemented through specific programmes

developed within each activity under the framework programme, and that each specific programme shall define the detailed rules for implementing it, fix its duration and provide for the means deemed necessary;

(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⁾ and Article 4(2) of the Council Decisions on the specific programmes implementing the fourth framework programme, the Commission has arranged for an external assessment to be conducted which it has transmitted to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions together with its conclusions and comments;

(4) Whereas, in accordance with Article 130j of the Treaty, Council Decision 1999/65/EC of 22 December 1998 concerning the rules for the participation of undertakings, research centres and universities and for the dissemination of research results for the implementation of the fifth framework programme of the European Community (1998 to 2002)⁽⁶⁾ (hereinafter referred to as 'the rules for participation and dissemination') applies to this specific programme; whereas these rules allow the

⁽¹⁾ OJ C 260, 18.8.1998, p. 1.

⁽²⁾ Opinion delivered on 15 December 1998 (not yet published in the Official Journal).

⁽³⁾ OJ C 407, 28.12.1998, p. 123.

⁽⁴⁾ OJ L 26, 1.2.1999, p. 1.

⁽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).

⁽⁶⁾ OJ L 26, 1.2.1999, p. 46.

participation of the Joint Research Centre in the indirect actions covered by this specific programme;

- (5) Whereas, for the purpose of implementing this programme, in addition to cooperation covered by the Agreement on the European Economic Area or by an Association Agreement, it may be appropriate to engage in international cooperation activities, in particular on the basis of Article 130m of the Treaty, with third countries or international organisations;
- (6) Whereas implementation of this programme will also comprise activities and mechanisms aimed at stimulating, disseminating and exploiting RTD results, in particular *vis-à-vis* small and medium-sized enterprises (SMEs), and activities to stimulate the mobility and training of researchers;
- (7) Whereas it is important that the scientific, industrial and user communities should contribute substantially to the definition of activities to be undertaken and should be involved, as appropriate, in the implementation of this programme;
- (8) Whereas research activities under the fifth framework programme should also be geared towards innovation in order to contribute, *inter alia*, to the objectives of the first action plan for innovation;
- (9) Whereas special emphasis should be placed on encouraging the participation of SMEs;
- (10) Whereas the equal opportunities policy of the Community must be taken into account in the implementation of this programme;
- (11) Whereas efficient and transparent management contributes to a more effective and user-friendly programme;
- (12) Whereas administrative expenditure should be included in the Community budget in a transparent fashion;
- (13) Whereas the implementation of this programme should be monitored with a view to adapting it, where appropriate, to scientific and technological developments; whereas in due course there should also be an assessment of progress with the programme by independent experts;
- (14) Whereas the Scientific and Technical Research Committee has been consulted on the scientific and technological content of the specific programmes,

HAS ADOPTED THIS DECISION:

Article 1

In accordance with Article 3(1) of the fifth framework programme, the specific programme on quality of life and management of living resources (hereinafter referred to as the specific programme) is adopted for the period from 25 January 1999 to 31 December 2002.

Article 2

1. In accordance with Annex III to the fifth framework programme, the amount deemed necessary for carrying out the specific programme is EUR 2 413 million, including a maximum of 6,5 % for the Commission's administrative expenditure.

An indicative breakdown of this amount is given in Annex I.

2. Of the amount in paragraph 1

— EUR 553 million is for the period 1998 to 1999,

and

— EUR 1 860 million is for the period 2000 to 2002.

In the case referred to in Article 2(1)(c) of the fifth framework programme, the Council shall adapt the latter figure in accordance with Article 2(1)(c), second indent of the fifth framework programme. Pending a decision by the Council, this specific programme shall not be implemented beyond the provision of the first indent.

3. The budgetary authority shall, in compliance with the scientific and technological objectives and priorities laid down in this Decision, set the appropriations for each financial year taking into account the availability of resources within the multiannual financial perspective.

Article 3

1. The general outlines, the scientific and technological objectives and the priorities for the specific programme are set out in Annex II. They are consistent with the principles and the three categories of selection criteria indicated in Annex I to the fifth framework programme.

2. In accordance with these principles and criteria the selection criteria indicated in Article 10 of the rules for participation and dissemination shall be applied for the selection of the RTD activities to be carried out.

In addition, any participation of industrial entities in industrially-orientated shared-cost actions should, as a general rule, be appropriate to the nature and purpose of the activity.

All these criteria shall be complied with in the implementation of the programme, including the work programme referred to in Article 5(1), although they may be weighted differently.

3. The rules for participation and dissemination shall apply to the specific programme.

4. The detailed rules for financial participation by the Community in the specific programme are those referred to in Article 4 of the fifth framework programme.

The indirect RTD actions under the specific programme are defined in Annexes II and IV to the fifth framework programme.

Specific rules for implementing the programme are set out in Annex III to this Decision.

Article 4

In the light of the criteria referred to in Article 3, and the scientific and technological objectives and priorities set out in Annex II, the Commission:

- (a) shall monitor, with appropriate assistance from independent external experts, the implementation of the specific programme and, where appropriate, submit proposals to Council for adapting it, in accordance with Article 5(1) of the fifth framework programme;
- (b) shall arrange for the external assessment provided for in Article 5(2) of the fifth framework programme to be conducted concerning the activities carried out in the fields covered by the specific programme.

Article 5

1. The Commission shall draw up a work programme specifying:

- (a) in greater detail, the objectives and RTD priorities of Annex II;

- (b) the indicative timetable for the implementation of the specific programme;
- (c) the coordination arrangements set out in Annex III and arrangements to secure the objectives, related to innovation and the participation of SMEs, of the third activity of the fifth framework programme;
- (d) where necessary, the selection criteria and the arrangements for applying them for each type of indirect RTD action.

2. The work programme shall take account of relevant interests, in particular the scientific, industrial and user communities. It shall serve as a basis for implementing the indirect RTD actions according to the procedures set out in the rules for participation and dissemination.

3. The work programme shall be updated where appropriate and be made available by the Commission to all interested parties in a user-friendly form, including in electronic form.

Article 6

1. The Commission shall be responsible for the implementation of this specific programme.

2. The procedure laid down in Article 7 shall apply for the adoption of the following measures:

- the drawing-up and updating of the work programme referred to in Article 5(1), including regarding the content of calls for proposals,
- approval of RTD actions proposed for funding, including participation by entities from third countries, where the estimated amount of the Community contribution under this programme is equal to or more than EUR 0,8 million,
- the drawing-up of the terms of reference for the external assessment provided for in Article 5(2) of the fifth framework programme,
- any adjustment to the indicative breakdown of the amount as set out in Annex I.

Article 7

1. The Commission shall be assisted by a programme committee (hereinafter referred to as 'the

committee') composed of representatives of the Member States and chaired by the representative of the Commission.

2. In the cases referred to in Article 6(2), the representative of the Commission shall submit to the committee a draft of measures to be taken. The committee shall deliver its opinion on the draft measures referred to above within a time limit which the Chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148(2) of the Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The Chairman shall not vote.

3(a) The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee.

(b) If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority.

If, on expiry of a period of nine weeks from the referral of the matter to the Council, the Council

has not acted, the proposed measures shall be adopted by the Commission.

4. The Commission shall regularly inform the committee of the overall progress of the implementation of the specific programme, and shall in particular provide it with information about the progress of all RTD actions funded under this programme.

Article 8

In accordance with Article 5(4) of the fifth framework programme, the Commission shall regularly inform the Council and the European Parliament of the overall progress of the implementation of the programme, including on the participation of SMEs and the simplification of administrative procedures.

Article 9

This Decision is addressed to the Member States.

Done at Brussels, 25 January 1999.

For the Council
The President
J. FISCHER

ANNEX I

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

<i>(million EUR)</i>	
Type of activity	Amount
(a) Key actions	
(i) Food, nutrition and health	290
(ii) Control of infectious diseases	300
(iii) The cell factory	400
(iv) Environment and health	160
(v) Sustainable agriculture, fisheries and forestry and integrated development of rural areas including mountain areas	520
(vi) The ageing population and disabilities	190
(b) Research and technological development activities of a generic nature	483
(c) Support for research infrastructures	70
Total	2 413

ANNEX II

THE GENERAL OUTLINES, THE SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES AND THE PRIORITIES

INTRODUCTION

Economic and political developments in Europe have globally resulted in greater prosperity, increased life expectancy and better working conditions. These improvements have, however, been accompanied by challenges such as higher healthcare costs, an ageing population, and environmental degradation and heightened ethical concerns. Increasingly, a gap is becoming evident between natural resources, whether from agriculture and fisheries, mining or the global environment, and human activities. Paradoxically, this has occurred at a time when there is an explosion in the knowledge base concerning the structure and working of all living things, pointing towards new developments in the corresponding sectors, for example healthcare, pharmaceuticals, agriculture, food, etc.

Europe has a strong tradition and an excellent record in research and application of life sciences and technologies. Furthermore, Europe provides a huge single market with a tradition of receptiveness for bio-based products. It has, therefore, the potential to address and solve major challenges such as a varied and safe food supply, affordable healthcare, better medicines, etc. The scientific basis on which living and natural materials are exploited for these ends is undergoing a dramatic change, in which the intimate and interactive workings of living beings are being revealed. With the progress of scientific knowledge in recent decades, one can now expect to probe more deeply the questions surrounding the production of food, the curing of diseases, and the sustainable management and use of biological resources. One can also anticipate clarifying their relationships with human behaviour and needs, industrial practices and consumer demands.

The strategic objective of the programme is to link the ability to discover to the ability to produce, in order to address the needs of society and to meet the requirements of the consumer, leading to future wealth and job creation and improvements in the state of the environment. The strategy of this programme is to focus on specific areas where growing knowledge potentially contains technical answers to some of the pressing questions asked by the citizen which require to be tackled on a European scale. Fundamental ethical values must also be respected.

The novelty of this approach is the willingness to couple the dynamics of massive knowledge production with few areas where there are expected to be desirable spin-offs, while pursuing the renewal of knowledge to reinforce European strengths in fields associated with further growth and quality of life.

The proposed scientific and technological solutions should be seen as part of an integrated system approach, in which human beings are at the core of the issue of the quality of life and of the management of living resources. Six key actions have been identified in which European research should make a contribution, by way of innovative products, processes or services, to problem resolution. These key actions are targeted at socioeconomic needs and the Community's policy objectives, for example in agriculture and fisheries, industry and consumers, and in the fields of health and environment. The gender dimension will be integrated throughout the programme where appropriate.

They are supplemented with research and technological development activities of a generic nature as well as support to research infrastructures aiming at building up, in the longer term, the knowledge base in areas of strategic importance for the future.

Meeting socioeconomic needs. On the demand side, research should be developed which promotes health, reconciles economic developments with environmental requirements, and improves the response to consumer needs. The exploitation of the results of the programme must take account of the socioeconomic dimension. On the supply side, there is huge potential for economic growth and job creation in this field, both in the traditional industries including primary production and in the nascent high technology industries.

Increasing European added-value. The major cross-border issues should be addressed selectively, such as health aspects of diseases (epidemiology, nutrition, food safety, ageing, including age-related disabilities and rare diseases), or transboundary resources management (terrestrial and aquatic living resources). Other areas such as drug abuse, biosafety or bioethics, involve the reinforcement of scientific bases in support of Community policies. Many of the activities to be addressed in the programme (e.g. genome research, neurosciences and technology assessment), due to their size and complexity, are only feasible if they are addressed at the European level.

Improving European competitiveness. The programme will capitalise on specific scientific strengths in knowledge areas and in productive sectors with strong growth potential, such as the biotechnology and food industries. Thus, the heart of this programme, improving the quality of life, promoting life sciences and technologies and decoupling economic growth from environmental degradation, will contribute in the short and in the longer term to European competitiveness and employment. Europe must promote start-ups in particular in the areas of biotechnology and the agro-food industry which have recently shown a consistent growth rate.

Promoting biosafety. The assessment of the behaviour and impact on human and animal health of recombinant organisms (e.g. transgenic plants, microorganisms, vaccines, etc.) and of their fate in the environment, where relevant, is part of every key action.

Respecting an ethical framework. Full respect of human rights and fundamental ethical principles will be ensured throughout all activities in the specific programme in accordance with Article 6 of the European Parliament and Council Decision on the fifth framework programme. These principles include animal welfare requirements in conformity with Community law.

LINKS AND COMPLEMENTARITY WITH THE OTHER PROGRAMMES

Coordination with other thematic programmes is based on promoting synergetic interactions and complementary activities and avoiding unnecessary duplication:

- coordination with the specific programme on a user-friendly information society is based on the following principle: activities concerned with information society technologies as such (which include development, demonstration and take-up actions) will be concentrated in the user-friendly information society programme; activities concerned with the deployment, integration and adaptation of information society technologies in applications relating to the quality of life and the management of living resources will be conducted in this programme,
- coordination with the programmes on competitive and sustainable growth and energy, environment and sustainable development is based on close interaction between the key action 'Food, nutrition and health' of this programme and the key action 'Innovative products, processes and organisation' of the programme on competitive and sustainable growth and the corresponding aspects of the programme on energy, environment and sustainable development. Similar interactions will be established between the key actions 'The cell factory' and 'Sustainable agriculture, fisheries and forestry and integrated development of rural areas, including mountain areas' with the relevant actions of the programmes on competitive and sustainable growth and energy, environment and sustainable development,
- close coordination will be developed with the programme 'Confirming the international role of Community research', in particular where collaboration with international initiatives could bring added-value to European RTD efforts,
- full use will be made of the possibilities offered by COST and Eureka and by cooperation with international organisations to foster synergy between actions and projects in this programme and nationally funded research activities. In the case of cooperation with Eureka, projects corresponding to themes of common interest with the framework programme may be developed in the context of the key actions in conformity with the selection criteria and procedures of the framework programme,

- specific activities aimed at facilitating the involvement of entities in third countries and maintaining links with specialists from third countries trained in Europe will be carried out, which will also contribute to the international dimension of the programme,
- concerning innovation and the participation of SMEs, as new knowledge in the biosciences constantly drives innovation, research partnerships need to be flexible and inclusive. A competitive partnership requires a high level of interaction of biology, engineering, information management, standardisation, capital investment, intellectual property rights, etc., which brings success only on a single-project basis. It will be imperative that measures to stimulate e.g. SMEs and financial partners accompany programme management for each individual action. An 'innovation unit' will focus the promotion activities with a view to the deployment and use of the results of this programme; it will also help to ensure complementarity and an interface with the innovation activities implemented in the context of the programme on 'Innovation and participation of SMEs',
- improving the know-how, skills and qualifications of European researchers and the understanding of the socioeconomic impact of research in the fields covered by this programme is essential to ensure sufficient availability of appropriate expertise and to establish tangible and lasting impacts. Training and socioeconomic research will therefore form an integral part of this programme, complemented by appropriate links with the horizontal programme 'Improving the human research potential and the socioeconomic knowledge base'. Training activities in this programme will include support to fellowships, which will take the form of 'Marie Curie' fellowships following the definitions and rules set out in the horizontal programme.

(a) **KEY ACTIONS**

(i) **Food, nutrition and health**

Objectives and RTD priorities

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 thereby promoting consumer protection and contributing to the fight against diseases related to food and the immense costs to health systems arising therefrom. The following scientific and technological objectives will be pursued:

- *development of safe and flexible and new and/or improved manufacturing processes and technologies.*

The aim is to improve the quality and consumer acceptability of food, while ensuring traceability of raw materials and final products.

RTD priorities: improved use of raw materials, production and processing and preservation systems; development of food crops and of functional and safe foods; use of fishery and aquaculture by-products and of poorly exploited species; quality and traceability of raw materials and food products in the food chain; minimal processing and process control; advanced food technologies and packaging systems; improvement of traditional technologies; quality monitoring and quality assurance, including the development of methods for measuring quality,

- *development of tests to detect and processes to eliminate infectious and toxic agents throughout the food chain.*

Research will focus on the hazards of food contaminants, their exact origins and strategies for safer food production.

RTD priorities: improved understanding and control of contamination conditions; rapid detection tests for pathogens, xenobiotics and hormones; new and safer methods of food production; new methodologies for accessing microbial, chemical and allergenic risks,

- *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.*

The aim is to reduce diet-related risk factors contributing to chronic disease and to develop new approaches for improved nutrition and more balanced diets.

RTD priorities: the role and impact of food and diet on physiological functions, and physical and mental performance; the particular nutritional needs of defined population groups; links between diet and chronic disease and disorders including genetic factors involved; consumer attitudes and reactions with regard to food products, food-processing methods and labelling.

(ii) Control of infectious diseases

Objectives and RTD priorities

The overall goal of this key action is to combat established, emerging or re-emerging infectious diseases including zoonoses, linked to old, new or mutated agents in humans or animals. This would be achieved primarily by mixing complementary expertise in transdisciplinary projects, by linking these activities to national and international organisations, and by encouraging the interface between academic research, policy-makers, healthcare providers, including the interface between preclinical and clinical research, and the human and animal healthcare industry, pursuing the following scientific and technological objectives:

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

RTD priorities: vaccines against emerging and re-emerging infectious diseases and other diseases related to infectious agents (e.g. some cancers) consistent with the relevant Community policy regarding the reduction and eventual replacement of animal testing; vaccines against animal pathogens; development of European networks for clinical and field trials of vaccines and drugs including, where necessary, better understanding of the immune system,

- *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.*

RTD priorities: improved understanding of mechanisms of protection against infectious agents, of drug resistance and control of immunological responses; technologies for safer and more efficient vaccines and immunotherapy; specific risk factors, including human behaviour and new technologies such as xenotransplants influencing the spread of infectious diseases and development of new and resistant strains; development and validation of diagnostic tests; research to support the development of an early-warning system and response network for infectious diseases; improved methodologies for early and accurate detection of adverse reactions to drugs and vaccines,

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

RTD priorities: organisational and economic aspects of public health and healthcare systems; surveillance, monitoring and assessment methodologies in prevention and cure; methodologies for product safety surveillance in the market place.

(iii) The cell factory

Objectives and RTD priorities

This key action is aimed at helping the Community's enterprises, either established or starting up, to exploit the advances made in life sciences and technology, particularly in the fields of health, environment, agriculture, agro-industries and high value-added products such as chemicals. It is aimed

at the development of multidisciplinary technologies based on the exploitation of the properties of microorganisms, plants and animals, in particular at the tissue, cellular and sub-cellular levels. The objective is to understand the versatile functioning of cells and to develop bio-reactors, bio-molecules and bio-processes with high added-value capable of enhancing the quality of life and health. Being a prerequisite to the functioning of cells as minute factories, sufficient knowledge will have to be secured of their blueprint at the scale at which they operate, through underpinning contributions of structural biology, physiology, nanobiotechnology, genomics and proteomics, with the support of notably physicochemistry, bioinformatics and biochemical engineering. To ensure the safety of new biomolecules or bioprocesses, methods will be made available for monitoring their potential impact on human and animal health, and their contribution to improving standards of environmental care.

This key action should also aim at using RTD to reinforce the prenormative research by making cell cultures available as models for medicine, pharmacology, toxicology and environmental monitoring as a substitute for animal testing. Emphasis would be put on the following scientific and technological objectives:

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

Research will focus on bio-products relevant to preventing, detecting and treating human and animal diseases and improving the quality of life.

RTD priorities: improved understanding of the cell, gene functions and gene-delivery methods applicable to the development of new diagnostic and therapeutic substances and strategies; anti-cancer agents, antibiotics, antibodies and therapeutics, vaccines, novel *in-vitro* testing and screening methods as alternatives to animal testing; cells as production units and as diagnostic and detection tools,

- *energy-efficient bio-remediation and waste bio-treatment processes*

The objective is to prevent, detect, monitor, treat and remove pollution as well as to maximise the economic value of waste.

RTD priorities: new bio-processes for preventing industrial pollution, treating, upgrading, and/or recycling bioaccumulable wastes and industrial by-products; bioassays and biosensors; biodegradation of recalcitrant chemicals by microbial catalysts alone or in combination with plant systems and/or chemical catalysts; biodiversity and ecological dynamics of natural and introduced populations,

- *new biological and biotechnological processes and products, new processing technologies using microorganisms, plants or animals for agrifood and agroindustry and high value-added chemical applications*

The focus is on high value biomolecules and bioprocesses leading to enhanced exploitation of renewable resources and to enhanced expression of desirable characteristics for microorganisms, plants and animals. These activities are targeted at sustainable and industrial exploitation prospects and take into account socioeconomic, agronomic, ecological and/or consumer perspectives.

RTD priorities: exploiting the cellular and sub-cellular characteristics of improved microorganisms, plants and animals, including through approaches at genome level; development of methods and strategies for identifying recombinant organisms and their residues in the environment and assessing their potential impact on human and animal health or the environment; new biocatalysts; use of terrestrial and marine organisms as a source of new valuable products; identification and sustainable use of metabolic and genetic diversity.

(iv) Environment and health

Objectives and RTD priorities

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. The following scientific and technological objectives will be pursued:

- *research into diseases and allergies related to or influenced by the environment and research into their treatment and prevention*

The focus is on health impairment caused directly by exposure to the environment and on ways of treatment and prevention, based on sound epidemiological data and an understanding of pathogenesis mechanisms. Research should also be conducted into the impact of environmental pollutants at the workplace.

RTD priorities: analysis and quantification of the impact of environmental factors on human health; assessment of the relative importance of, and the interactions between, factors impinging on health; improved understanding of the interrelations between environmental and public-health indicators for better treatment and prevention; development of an integrated approach to risk assessment taking into account epidemiological, environmental and public-health aspects; bio-markers of environmental exposure and an eventual replacement of animal testing,

- *development of new methods of diagnosis, risk assessment and of processes to reduce causes and harmful environmental health effects*

The objective is to use a multidisciplinary approach for better understanding of the interactions between the social and physical environment, genetic factors and health and to improve the identification of vulnerable groups to environmental exposures and to identify preventive measures in order to reduce causes and environmental factors hazardous to health.

RTD priorities: bio-markers (including bio-indicators) of environmental exposure, effect and/or susceptibility to environmental agents, including mixed exposures and cumulative effects; improvement of predictive toxicity testing and mechanism-based risk assessment consistent with the general objectives of reducing, refining and eventually replacing animal testing; improved methods and technologies for long- and short-term exposure and effects assessment; epidemiological and biomedical studies on possible effects linked to non-ionising irradiation, particularly from cellular phones.

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

Objectives and RTD priorities

The aim is to develop knowledge and technologies for the production and exploitation of living resources, including forests, covering the whole production chain, taking into account the highly competitive international context and in the light of the need for adaptation to the evolution of the common agricultural and fisheries policies, while also providing the scientific basis for Community regulations and standards, and to promote the multifunctional role of forests and the sustainable management and utilisation of forest resources as an integral factor of rural development. The priority areas are as follows:

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

RTD priorities:

- for agriculture: sustainable farm production systems and methods and corresponding *ex-ante* and *ex-post* control and analysis; diversification of production and activities; support to Community policies on plant health (prevention and prediction of, protection against plant diseases and harmful organisms), animal health (prevention, control, eradication of major diseases and zoonoses) and animal welfare; identification and characterisation of the quality of agrofood products and agricultural farm-processed products and farm-processing technologies; definition of parameters, specifications, methods, forms of organisation and technologies for total quality; organic farming systems; plant and animal breeding, including relevant application-oriented genome research, and diversity of genetic resources,
- for fisheries: support to integrated fishery management linking resource conservation, means of capture, interactions with ecosystems, market requirements and socioeconomic considerations; identification and characterisation of the quality of marine products and technologies; development of new concepts for the sustainable use of marine and aquatic living resources,
- for aquaculture: sustainable production systems with the reduction of impact on ecosystems and diversification of cultivated species (both plant and animal); improvement of production techniques; genetic improvement; disease resistance and control,
- *integrated production and exploitation of biological materials for non-food uses*

This will cover integrated production and processing chains with the emphasis on end-use and market requirements.

RTD priorities: industrial products from the green chemical, biopolymers and bioenergy integrated chains,

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

This encompasses sustainable management and multiple use of European forest resources, in harmony with the political, environmental and social needs, bringing economic growth and employment to rural and coastal areas.

RTD priorities: support to policy issues; multifunctional and sustainable management of forests combining quality production and new and improved technologies with conservation and environmental protection, including protection of forests soils and protection against natural hazards (e.g. forest fires); diversification (non-wood uses including recreational uses, agro-sylvo-pastoral systems). Forests ecosystems biodiversity and genetic improvement. Strategies for sustainable management and multipurpose utilisation of forest resources; the forestry-wood chain; efficient, environment-friendly processes and recycling technologies; high value-added and diversified products accounting for market needs, and consumer requirements,

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

The aim is to support the sound implementation of the common agricultural and fisheries policies and related activities. This research may also be useful to the Community in the context of international trade negotiations and of dispute settlements in the framework of WTO, in the area of agriculture.

RTD priorities: reliable, transparent and cost-effective methods of monitoring, assessment and control,

- *pre-legislative research designed to provide a scientific basis for Community legislation*

The aim is to provide support for Community regulations by prenormative research activities.

RTD priorities: prenormative research to provide the scientific basis for regulations in the context of the common agricultural and fisheries policies,

- *new tools and models for the integrated and sustainable development of rural and other relevant areas*

This approach is based on optimisation of the specific potential of each area, including at regional level, the diversification of activities and land use and the involvement of the people concerned.

RTD priorities: analysis of the situation and changes under way, taking into account the relationships between all the sectors involved and the factors influencing technological and socioeconomic changes; multifunctional land use and landscape management as related to important ecosystems and habitats taking also into account aspects relating to cultural heritage; diversification and job opportunities; development of the 'integrated rural and fishery development' concept, with the investigation of potentials and constraints, the elaboration of new models and tools, including for spatial planning and the improvement of the organisational capacity of local actors; support to follow-up and evaluation of rural and coastal development programmes and policies with tools to monitor, assess and forecast socioeconomic and environmental benefit.

(vi) The ageing population and disabilities

Objectives and RTD priorities

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, disabilities and health problems with high morbidity, which are age-related and where there is a real prospect of significant prevention, treatment or delay in onset*

RTD priorities: studies on age-related diseases and disorders in the older population (Parkinson's, Alzheimer's diseases, etc.); physiology and pathophysiology of ageing and disability; co-morbidity studies,

- *RTD into biological, psychological, social and economic determinants of healthy ageing and of the mechanisms leading to disability and the postponement of disability*

RTD priorities: cellular and molecular bases of ageing; genetic predisposition; immunology of ageing; basic biological and psychological mechanisms underlying age-related changes (including occupational and genetic effects); model studies and model diseases for specific ageing processes; biomarkers; endocrine, neurocrine and metabolic factors of ageing; psychological implications of ageing,

- *demographic and epidemiological RTD into ageing and disability trends to enable prediction of the size and nature of the ageing population as a basis for policy and planning*

RTD priorities: clinical trials; analysis and quantification of demographic, medical, sociological, lifestyle (including exercise, mobility and nutrition) and environmental factors; prevention; methodology linked to collection of specific data,

- *RTD into new approaches to delaying the onset of disability, to reducing the challenge to older people of their social and physical environment, including the design and development of products*

and services adapted to their needs (e.g. in housing, transport and leisure) and to supporting mental and physical functioning

RTD priorities: methodology relating to quality of life, social integration and coping mechanisms; technologies contributing to less dependency; research on sensory degenerations; psychomotor, sensory and cognitive impairments; rehabilitation and replacement therapies; intervention assessment studies; assessment and quantification of needs and design/development of competitive and adapted products and services,

- *RTD into 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*

RTD priorities: healthcare outcome research for elderly and disabled, research into specific health services and social care services, as well as into healthcare services organisation; efficiency and quality of healthcare delivery for the elderly; impact of ageing on the evolution and financing of care systems, notably for long term care, and of pensions.

(b) RESEARCH AND TECHNOLOGICAL DEVELOPMENT ACTIVITIES OF A GENERIC NATURE

These activities have a longer-term impact that may even preclude the possibility of satisfying some of the citizens' expressed needs, for as long as fragmentary knowledge is not pooled together to a sufficient degree of completeness. There is, in the related disciplines, a time-dependent need for integration of the science base, which is why industry, services and policy-making in Europe must maintain or reinforce their response capacity in a rapidly changing world.

Efficient interaction between research laboratories and industry will be promoted. Clustering of projects involving core centres and associated laboratories will be encouraged to create a critical mass, to promote interaction between basic and applied research and to ensure maximum transfer of knowledge to and from industry and undertakings. Support ranging from training of young scientists to fellowships for senior researchers will be developed.

- *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 multifactorial diseases (e.g. genetic, environmental, lifestyle) of high (e.g. cardiovascular, 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. The objective is to increase knowledge with regard to the genetic basis, epidemiology, pathogenesis and diagnosis of diseases by integrating basic and clinical research, and to apply modern technology to the treatment and control of major diseases, including rare (e.g., Creutzfeldt-Jakob Disease) and orphan diseases (e.g. illnesses which are prevalent in industrialised or developing countries but are receiving less attention for research in industrialised countries).

RTD priorities: contribution of molecular, genetic, environmental and lifestyle factors and their interactions to the aetiology, pathophysiology, progress and outcome of diseases, leading to new approaches to prevention, diagnosis and treatment, including the development of orphan drugs. Evaluation of novel therapies where multinational, large-scale studies/trials are required, and optimum use of databases, registries, reagents and sample banks,

- *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 genome information to the

benefit of European health, agriculture, 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. Efforts will be made to ensure that the gap between diagnostic and therapeutic possibilities does not widen.

RTD priorities: this area will address the meaning of genome information and the improvement of the knowledge and understanding of the genetic basis of diseases, including chronic and degenerative diseases. This will require structural studies; comparative analyses of genomes and proteomes; development of novel and user-friendly informatics approaches to enable acquisition of, access to and interpretation of genomic and functional data; development of novel expression systems, model organisms, mutant, transgenic and hybrid organisms with strict regard to ethical principles and the principles of biosafety; development and application of underpinning biochemistry, biophysical, statistical and computational approaches,

— *Neurosciences*

This activity will provide new insights and a better understanding of the mechanisms governing the interrelationship of biological and psychological processes, to promote new diagnostic (e.g. imaging), preventive and therapeutic approaches to neurological and psychiatric disorders and to underpin opportunities for education, innovation in healthcare and computational industries. In this context, synergy and an appropriate flow of information will be strengthened with the human frontier science programme.

RTD priorities: the integration of diverse disciplines, technologies and levels of biological organisation in the following areas: cell communication, mechanisms of learning and memory; mechanisms of brain development, disorder and repair, and their clinical, epidemiological and social implementations. Brain theory, computational neurosciences, and neuroinformatics; human behaviour, cognition and functional mapping of the brain. Integration of theoretical and experimental approaches; integration of basic and clinical research in developing innovative diagnostic, preventive and therapeutic strategies based on novel genetic, cellular, non-invasive, pharmacological and psychological approaches,

— *Public health and health services research*

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

RTD priorities: improved methodologies in epidemiology; identification of new health determinants (including factors leading to inequalities in health) and aetiological factors of disease through common methodologies and comparative research; socioeconomic and organisational determinants of prevention, care and health services; at the workplace and in the home exposure to biological, chemical and physical agents and to physical and mental stress.

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.

RTD priorities: comparative and analytical research on biological and social causes, risk factors and effects of drug addiction and misuse; psychological and socioeconomic factors of drug abuse; long-term health effects of drug consumption; physical detection aspects, drug profiling and biological monitoring of drugs,

— *Research relating to the disabled*

The aim of this activity is to enhance the quality of life and independence of disabled people.

RTD priorities: research aimed at contributing to improvement of their social and physical environment and the effective and efficient delivery of the health and social care services available to them,

— *Study of problems relating to medical ethics and bioethics in the context of respect for fundamental human values*

The objective is to identify the ethical, legal and social questions raised, not only by medical and biological research alone but also, more broadly, by scientific and technological developments to understand and to promote public discussion of issues of public concern, and to analyse the ethical dimension of legal and regulatory measures.

RTD priorities: ethical aspects of life sciences research and its application to medical practice, food, animals, plants, and the environment⁽¹⁾,

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

Competitiveness and sustainable development will together be the source of the Union's future wealth and employment opportunities, ensuring an enhanced quality of life for Europe's citizens.

Simultaneous pursuit of these objectives is only possible through an adequate recognition of the key interrelations between technologies, environment and society and integration of knowledge into sustainable development policies.

Socioeconomic research is also needed to enhance the quality of the public debate, as illustrated by the interest shown in the applications of modern biotechnologies and its scientific bases and the need for transparent information. The regulatory process in life sciences and technologies and its

⁽¹⁾ Research activities under this programme must comply with the international conventions and codes of conduct, and in particular the Helsinki Declaration of the World Medical Association adopted by the World Medical Assembly.

Account will also be taken of the declaration of the European Council of Amsterdam and the European Parliament's resolution on the banning of human cloning (OJ C 115, 14.4.1997), the European Convention on Human Rights and Biomedicine of the Council of Europe; the opinions of the Group of Advisers on the Ethical Implications of Biotechnology (1991 to 1996) and the opinions of the European Group on Ethics in Science and New Technologies (as from 1998); the Universal Declaration on the Human Genome and Human Rights of UNESCO of 11 November 1997 and the resolutions of the WHO, as well as relevant EC legislation for example, Council Directives of 26 January 1965 and 20 May 1975 on the approximation of the laws, regulations and administrative provisions relating to proprietary medicinal products (65/65/EEC and 75/319/EEC), Council Directive of 24 November 1986 on the approximation of the laws, regulations and administrative provisions of the Member States relating to the protection of animals used for experimental and other scientific purposes (86/609/EEC).

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 hereditary will be supported under the present framework programme. In the same way, no research activity understood in the sense of the term 'cloning', 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 later stage of development to the human embryo, will be supported.

Concerning animal experimentation, the principles of replacement by alternative methods, reduction of the number of animals and the refinement of experiments must be applied to the extent possible. Animal suffering must be avoided or kept to a minimum and special attention must be paid to animal experimentation involving species that are the closest to human beings.

Modification of the genetic heritage of animals and animal cloning will be envisaged within this programme only for objectives which are justified on ethical grounds and when carried out under conditions respecting animal welfare and genetic diversity.

Participants in EC research projects must conform to national legislation and applicable codes of conduct and seek the approval of the relevant ethics committee prior to the start of the RTD activities.

impact on citizen's confidence influences public opinion, which in turn has a strong impact on decision-makers.

The objectives are to assist in the construction of strategies and models for sustainable development and to provide a sound scientific basis for the conception, implementation and evaluation of relevant policies, exploiting knowledge and technologies from the life sciences and technologies (including the creation of employment opportunities in the bio-industries), and to develop a better understanding of the links between science and policy; including the ways in which opinions on the benefits and risks of technological progress are formed and are reflected in the regulatory process.

RTD priorities: technology evaluation and assessment, systematic provision of information to the public, education and opinion forming in the field of life sciences and technologies; analysis of social and economic driving forces and of new opportunities in the bioindustries; development of indicators and knowledge bases relevant to decision-making and regulation; analysis of the social and economic aspects of the links between life sciences and technologies and policies in the field of industry, agriculture, fisheries, food, environment, sustainable development, public health, etc.

(c) SUPPORT FOR RESEARCH INFRASTRUCTURES

Objectives

To broaden access, to make optimum use of and to improve the consistency of the existing European research fabric at Community level.

To facilitate and to encourage transnational cooperation in the rational and cost-effective development of RTD facilities in response to emerging needs.

In order to reinforce the European added-value and the optimisation of the required efforts, Community support will be directed towards: transnational coordination, integrated management of, specific aspects of operation of, access to and improvement of existing facilities; coordination and complementation of national or multinational initiatives to develop facilities needed at the European level; networking of communities of researchers and users through research projects and specific training activities centred on appropriate infrastructures, or cooperation of several partners, leading to an integrated service provider; increasing the compatibility of dispersed systems, aiming to provide rapid and effective integration of facilities and resources.

Classes of infrastructures

- Biological data and collections of biological material. Databases, information services and networks of biological expertise; major specialised instrumentation for the study of biological structures; collections of genetic materials, living and non-living specimens; breeding of animals to develop models of human diseases,
 - clinical research facilities, including pre-clinical research, identification of studies and clinical trials that should be done at the European level,
 - facilities for aquaculture and fishery research.
-

ANNEX III

SPECIFIC RULES FOR IMPLEMENTING THE PROGRAMME

The specific programme will be implemented through the indirect RTD actions as provided for in Annexes II and IV to the fifth framework programme. In addition, the following rules specific to this programme will apply:

1. Accompanying measures

The accompanying measures will comprise in particular:

- studies in support of the specific programme, including the preparation of future activities,
- the exchange of information, conferences, seminars, workshops and scientific and technical meetings,
- recourse to external expertise, including access to scientific databases, in particular for the purposes of the monitoring of the specific programme provided for in Article 5(1) of the fifth framework programme, the external assessment provided for in Article 5(2) of the fifth framework programme and the evaluation of indirect RTD actions and the monitoring of their implementation,
- dissemination, information and communication activities, including scientific publications, activities for the exploitation of results and the transfer of technologies, encouragement of innovation financing and assistance with the protection of intellectual property,
- training schemes related to RTD activities covered by the specific programme other than Marie Curie fellowships,
- support for schemes to provide information and assistance for research players, including SMEs,
- recourse to external expertise in setting up and providing access to information, assistance and research and innovation promoting services and networks.

2. Coordination arrangements

The Commission will endeavour to ensure complementarity between the indirect RTD actions under the programme, in particular by grouping them around a common objective, and to avoid duplication, while respecting the legitimate interests of proposers of indirect RTD actions.

As far as possible, coordination will also be ensured between actions under the specific programme and those carried out in:

- other specific programmes implementing the fifth framework programme,
- the research and training programmes implementing Council Decision 1999/64/Euratom of 22 December 1998 concerning the fifth framework programme of the European Atomic Energy Community (Euratom) for research and training activities (1998 to 2002)⁽¹⁾,
- other European research frameworks including Eureka and COST,
- other Community research-related instruments.

⁽¹⁾ OJ L 26, 1.2.1999, p. 34.

It will comprise:

- (i) the identification of common themes or priorities, resulting in particular in:
 - the exchange of information,
 - the carrying out of work decided on jointly, entailing in particular the joint initiation of one of the procedures referred to in Article 9 of the rules for participation and dissemination;
 - (ii) the reassignment of proposals for indirect RTD actions between specific programmes or between a specific programme and a research and training programme.
-

COUNCIL DECISION

of 25 January 1999

adopting a specific programme for research, technological development and demonstration
on a user-friendly information society (1998 to 2002)

(1999/168/EC)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 130i(4) thereof,

Having regard to the proposal from the Commission⁽¹⁾,

Having regard to the opinion of the European Parliament⁽²⁾,

Having regard to the opinion of the Economic and Social Committee⁽³⁾,

(1) Whereas by Decision No 182/1999/EC⁽⁴⁾, the European Parliament and the Council adopted the fifth framework programme of the European Community (hereinafter referred to as the fifth framework programme) for research, technological development and demonstration (hereinafter referred to as RTD) activities for the period 1998 to 2002 setting out the general outlines and scientific and technological objectives of the activities to be carried out in the field of user-friendly information society;

(2) Whereas Article 130i(3) of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity under the framework programme, and that each specific programme shall define the detailed rules for implementing it, fix its duration and provide for the means deemed necessary;

(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⁾ and Article 4(2) of the Council Decisions on the specific programmes implementing the fourth framework programme, the Commission has arranged for an external assessment to be conducted which it has transmitted to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions together with its conclusions and comments;

(4) Whereas, in accordance with Article 130j of the Treaty, Council Decision 1999/65/EC of 22 December 1998 concerning the rules for the participation of undertakings, research centres and universities and for the dissemination of research results for the implementation of the fifth framework programme of the European Community (1998 to 2002)⁽⁶⁾ (hereinafter referred to as 'the rules for participation and dissemination') applies to this specific programme; whereas these rules allow the participation of the Joint Research Centre in the indirect actions covered by this specific programme;

(5) Whereas, for the purpose of implementing this programme, in addition to cooperation covered by the Agreement on the European Economic Area or by an Association Agreement, it may be appropriate to engage in international cooperation activities, in particular on the basis of Article 130m of the Treaty, with third countries or international organisations;

(6) Whereas implementation of this programme will also comprise activities and mechanisms aimed at stimulating, disseminating and exploiting RTD results, in particular *vis-à-vis* small and medium-sized enterprises (SMEs), and activities to stimulate the mobility and training of researchers;

⁽¹⁾ OJ C 260, 18.8.1998, p. 16.

⁽²⁾ Opinion delivered on 15 December 1998 (not yet published in the Official Journal).

⁽³⁾ OJ C 407, 28.12.1998, p. 123.

⁽⁴⁾ OJ L 26, 1.2.1999, p. 1.

⁽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).

⁽⁶⁾ OJ L 26, 1.2.1999, p. 46.

- (7) Whereas it is important that the scientific, industrial and user communities should contribute substantially to the definition of activities to be undertaken and should be involved, as appropriate, in the implementation of this programme;
- (8) Whereas research activities under the fifth framework programme should also be geared towards innovation in order to contribute, *inter alia*, to the objectives of the first action plan for innovation;
- (9) Whereas special emphasis should be placed on encouraging the participation of SMEs;
- (10) Whereas the equal opportunities policy of the Community must be taken into account in the implementation of this programme;
- (11) Whereas efficient and transparent management contributes to a more effective and user-friendly programme;
- (12) Whereas administrative expenditure should be included in the Community budget in a transparent fashion;
- (13) Whereas the implementation of this programme should be monitored with a view to adapting it, where appropriate, to scientific and technological developments; whereas in due course there should also be an assessment of progress with the programme by independent experts;
- (14) Whereas the Scientific and Technical Research Committee has been consulted on the scientific and technological content of the specific programmes,

Article 2

1. In accordance with Annex III to the fifth framework programme, the amount deemed necessary for carrying out the specific programme is EUR 3 600 million, including a maximum of 7,5 % for the Commission's administrative expenditure.

An indicative breakdown of this amount is given in Annex I.

2. Of the amount in paragraph 1

— EUR 857 million is for the period 1998 to 1999,

and

— EUR 2 743 million is for the period 2000 to 2002.

In the case referred to in Article 2(1)(c) of the fifth framework programme, the Council shall adapt the latter figure in accordance with Article 2(1)(c), second indent of the fifth framework programme. Pending a decision by the Council, this specific programme shall not be implemented beyond the provision of the first indent.

3. The budgetary authority shall, in compliance with the scientific and technological objectives and priorities laid down in this Decision, set the appropriations for each financial year taking into account the availability of resources within the multiannual financial perspective.

Article 3

1. The general outlines, the scientific and technological objectives and the priorities for the specific programme are set out in Annex II. They are consistent with the principles and the three categories of selection criteria indicated in Annex I to the fifth framework programme.

2. In accordance with these principles and criteria the selection criteria indicated in Article 10 of the rules for participation and dissemination shall be applied for the selection of the RTD activities to be carried out.

In addition, any participation of industrial entities in industrially-orientated shared-cost actions should, as a general rule, be appropriate to the nature and purpose of the activity.

HAS ADOPTED THIS DECISION:

Article 1

In accordance with Article 3(1) of the fifth framework programme, the specific programme on a user-friendly information society; (hereinafter referred to as the specific programme) is adopted for the period from 25 January 1999 to 31 December 2002.

All these criteria shall be complied with in the implementation of the programme, including the work programme referred to in Article 5(1), although they may be weighted differently.

3. The rules for participation and dissemination shall apply to the specific programme.

4. The detailed rules for financial participation by the Community in the specific programme are those referred to in Article 4 of the fifth framework programme.

The indirect RTD actions under the specific programme are defined in Annexes II and IV to the fifth framework programme.

Specific rules for implementing the programme are set out in Annex III to this Decision.

Article 4

In the light of the criteria referred to in Article 3, and the scientific and technological objectives and priorities set out in Annex II, the Commission:

- (a) shall monitor, with appropriate assistance from independent external experts, the implementation of the specific programme and, where appropriate, submit proposals to Council for adapting it, in accordance with Article 5(1) of the fifth framework programme;
- (b) shall arrange for the external assessment provided for in Article 5(2) of the fifth framework programme to be conducted concerning the activities carried out in the fields covered by the specific programme.

Article 5

1. The Commission shall draw up a work programme specifying:

- (a) in greater detail, the objectives and RTD priorities of Annex II;
- (b) the indicative timetable for the implementation of the specific programme;
- (c) the coordination arrangements set out in Annex III and arrangements to secure the objectives, related to innovation and the participation of SMEs, of the third activity of the fifth framework programme;

(d) where necessary, the selection criteria and the arrangements for applying them for each type of indirect RTD action.

2. The work programme shall take account of relevant interests, in particular the scientific, industrial and user communities. It shall serve as a basis for implementing the indirect RTD actions according to the procedures set out in the rules for participation and dissemination.

3. The work programme shall be updated where appropriate and be made available by the Commission to all interested parties in a user-friendly form, including in electronic form.

Article 6

1. The Commission shall be responsible for the implementation of this specific programme.

2. The procedure laid down in Article 7 shall apply for the adoption of the following measures:

- the drawing-up and updating of the work programme referred to in Article 5(1), including regarding the content of calls for proposals,
- approval of RTD actions proposed for funding, including participation by entities from third countries, where the estimated amount of the Community contribution under this programme is equal to or more than EUR 1,5 million,
- the drawing-up of the terms of reference for the external assessment provided for in Article 5(2) of the fifth framework programme,
- any adjustment to the indicative breakdown of the amount as set out in Annex I.

Article 7

1. The Commission shall be assisted by a programme committee (hereinafter referred to as 'the committee') composed of representatives of the Member States and chaired by the representative of the Commission.

2. In the cases referred to in Article 6(2), the representative of the Commission shall submit to the committee a draft of measures to be taken. The committee shall deliver its opinion on the draft

measures referred to above within a time limit which the Chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148(2) of the Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The Chairman shall not vote.

3(a) The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee.

(b) If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority.

If, on expiry of a period of nine weeks from the referral of the matter to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

4. The Commission shall regularly inform the committee of the overall progress of the

implementation of the specific programme, and shall in particular provide it with information about the progress of all RTD actions funded under this programme.

Article 8

In accordance with Article 5(4) of the fifth framework programme, the Commission shall regularly inform the Council and the European Parliament of the overall progress of the implementation of the programme, including on the participation of SMEs and the simplification of administrative procedures.

Article 9

This Decision is addressed to the Member States.

Done at Brussels, 25 January 1999.

For the Council
The President
J. FISCHER

ANNEX I

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

<i>(million EUR)</i>	
Type of activity	Amount
(a) Key actions	
(i) Systems and services for the citizen	646
(ii) New methods of work and electronic commerce	547
(iii) Multimedia content and tools	564
(iv) Essential technologies and infrastructures	1 363
(b) Research and technological development activities of a generic nature: Future and emerging technologies	319
(c) Support for research infrastructures: Research networking	161
Total	3 600 ⁽¹⁾

⁽¹⁾ Of which at least 10 % for cross-programme themes, and a minimum of 2 % for integrated application platforms.

ANNEX II

THE GENERAL OUTLINES, THE SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES AND
THE PRIORITIES

INTRODUCTION

We are undergoing a fundamental transformation: from an industrial society to the information society. Information society technologies increasingly pervade all industrial and societal activities and are accelerating the globalisation of economies, in particular by providing SMEs with new ways to access to the global marketplace, and societies.

Europe's industrial competitiveness, its jobs, its quality of life and the sustainability of growth depend on it being at the leading edge of the development and take-up of information society technologies. Also, by enabling communities in remote and rural areas to overcome isolation and to compete in the global economy, information society technologies contribute to cohesion in the European Union.

At the same time, the technologies underpinning the development of the information society are in rapid evolution. Advances in information processing and communications are opening up exciting new possibilities. There is a shift from stand-alone systems to networked information and processes. Digitalisation is resulting in the convergence of information processing, communications and media. Content is of increasing significance. However, the increasing diversity and complexity of systems is also presenting new challenges for their development and use.

It will not be possible to realise the full potential of the information society in Europe with only today's technologies and applications. Key requirements such as usability, dependability, interoperability and, above all, affordability are far from being sufficiently met for the broad deployment of information society technologies (i.e. information and communication technologies, systems, applications and services) in all areas. Continuous efforts are required, in research, technological development, demonstration and technology take-up. 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.

Strategic objectives of the programme

The strategic objective of the information society technologies (IST) programme is to realise the benefits of the information society for Europe both by accelerating its emergence and by ensuring that the needs of individuals and enterprises are met.

The programme has four interrelated specific objectives, which both focus the technology developments and enable the close articulation between research and policy needed for a coherent and inclusive information society. For the private individual the objective is to meet the needs and expectations of European citizens for high-quality, affordable general interest services. Addressing the requirements and concerns of Europe's enterprises, workers and consumers the objective is to enable both individuals and organisations to innovate and be more effective and efficient in their work and business, while at the same time improving the quality of the individual's working life. Multimedia content is central to the information society; the objective here is to confirm Europe as a leading force in this field and enable it to realise the potential of its creativity and culture. For the essential technologies and infrastructures that form the building blocks of the information society the objective is to drive their development, enhance their applicability and accelerate their take up in Europe.

Novelty of the approach. Community-funded research in information and communication technologies and applications is integral to the overall strategy of the European Union for the information society, which was defined by the action plan 'Europe's way towards the information society' and revised in the action plan adopted in November 1996. The information society technologies (IST) programme introduces a new approach to the information society theme of the framework programme.

Integration. The context, rationale and objectives of the IST programme necessitate a single and integrated programme which reflects the convergence of technologies and media and of industries and markets, together with the increasing significance of content, and responds to the need to integrate research and development and take-up actions. To this effect, this programme consists of a set of four key actions centred on the four specific objectives and a specific activity on longer-term or higher-risk research on future and emerging technologies. These activities complement each other and are derived by grouping together the technologies, systems, applications and services and the research and development and take-up actions with the greatest affinity or interdependence. Each activity has its own specific focus and priorities, however, the key issues of usability, interoperability, dependability and affordability will be addressed ubiquitously throughout the programme. In doing so, each key action will, as appropriate, have a balance of the complete range of RTD activities from basic research to demonstration and take-up actions.

Cross-programme themes. The coordination and integration of the activities through a single work programme allows a 'theme' that cuts across the programme (e.g. interfaces, mobility or satellite-related activities) to be addressed in a coherent manner in more than one activity, each concentrating on and contributing from its particular perspective. Clustering and concertation will be used to focus, coordinate and integrate activities. Work, spanning the programme, will be undertaken on integrated application platforms to provide seamless interaction between citizens, businesses and administrations by realising coherent groups of public and private services customised to users' requirements, these will be demonstrated and assessed in 'digital sites', encompassing cities or regions, paving the way to 'digital communities' in urban, rural, remote and ultraperipheral areas, and will be appropriately coordinated with other key actions, for example 'The city of tomorrow and cultural heritage', and initiatives in the Structural Funds. It will build on activities from all parts of this programme.

Flexibility. The technological scope of the activities provides the flexibility to refocus over time, through the single rolling work programme (defined in consultation with the key actors), to respond to changes in industrial and societal needs and the technological context.

Socioeconomic needs. A vast range of goods, services and processes are being transformed through the integration and use of information society technologies. Work will target the quantitative and qualitative benefits that information society technologies offer in all industrial and societal activities, from more competitive methods of working and doing business to higher-quality, lower-cost general interest services or new forms of leisure and entertainment. It will take account of the info-ethical implications, of the necessity to remove discriminating factors, such as gender bias, to ensure ease of access and use, and of the ageing population and of the need to contribute to increasing resource efficiency and reducing environmental impact. Socioeconomic research, together with the results of other Community initiatives that identify needs for information society technologies, such as regional programmes, will be integrated throughout the programme, to support the take-up of information society technologies, and into its management. As too will be work on statistics, which are central to the information society and for which information society technologies offer new ways to attain the highest standards of quality and the widest and most rapid and accessible dissemination. Particular attention will be paid to ensuring that the 'innovation dimension' is actively addressed, and to stimulating and supporting the participation of SMEs, so as to contribute to the effective take-up of research results for economic and societal benefit.

European added-value. Realising the full potential of the information society requires technologies, infrastructures, applications and services, accessible and usable by anyone, anywhere, anytime, whether it be for business or individual use. Collaborative research and technological development is needed to create both the critical efforts and the interoperability necessary to ensure this in Europe. Pan-European research is also needed to ensure that content, together with its creation and use, properly reflects and exploits the EU's cultural diversity and many languages.

European competitiveness. Information society technologies are integrated in or support products and processes in all sectors of the economy. To be competitive in the global marketplace Europe needs to master both the supply and use of information society technologies. To this end, to accelerate the realisation of knowledge as innovation, this programme integrates actions to stimulate the take-up of information society technologies with the research and technological development to ensure that the conditions and requirements for their use can be met. In addition to demonstrations and trials, these include actions to stimulate the development and diffusion of the skills necessary to take-up research and development results (such as validations, assessments, awareness building, first-user actions and best-practice initiatives) and consensus building and standardisation activities.

LINKS AND COMPLEMENTARITY WITH THE OTHER PROGRAMMES

Articulation with the other thematic programmes is based on concentrating the activities concerned with the development, demonstration and take-up of information society technologies in this programme and concentrating their deployment (domain-specific integration research as well as use) in specific domains in the other thematic programmes. The nature of information society technologies requires close coordination with other programmes and relevant policy initiatives in areas where their deployment plays a critical role. Particular attention will be paid to the programmes covering manufacturing, transport, the environment and healthcare. In the case of satellite-related activities, these will be coordinated with related activities in other programmes and initiatives in the context of the Commission's Space Coordination Group. In accordance with Article 6 of the European Parliament and Council Decision on the fifth framework programme, the utmost respect will be ensured for human rights and fundamental ethical principles in all the activities under the specific programme.

Reflecting the global nature of the information society, international cooperation will play a major role in the development and take-up of information society technologies. This will be reflected in the participation in and operation of this programme, including support for international initiatives such as IMS (intelligent manufacturing systems), and in its linkages with the programme on confirming the international role of Community research addressing support for organisations from third countries.

Specific activities to facilitate the participation of organisations from third countries and to maintain links with European-trained specialists in third countries will also be used in addressing the international dimension of the programme. Where appropriate, work will complement and be coordinated with that in the COST framework. Innovation activities integrated throughout the programme will provide a focus for the promotion of the deployment and use of results stemming from this programme and help ensure complementarity with and interface to innovation activities carried out within the programme 'Promotion of innovation and encouragement of SME participation'. In addition, links at the programme level with Eureka, trans-European network actions and other Community instruments will be used to promote appropriate routes and mechanisms for the further take-up and the deployment of results. Links with the programme on promotion of innovation and encouragement of SME participation will complement the actions to reinforce the effective participation of SMEs (such as exploratory awards) that are integrated in this programme.

Improving the know-how, skills and qualifications of European researchers and the understanding of the socioeconomic impact of research in the fields covered by this programme is essential to ensure sufficient availability of appropriate expertise and to establish tangible and lasting impacts. Training and socioeconomic research will therefore form an integral part of this programme, complemented by appropriate links with the horizontal programme 'Improving the human research potential and the socioeconomic knowledge base' and European Social Fund initiatives. Training activities will include support to fellowships, which will take the form of 'Marie Curie' fellowships following the definitions and rules set out in the horizontal programme. This programme's work on research networking will interface with the horizontal programme's support for access to large computing facilities and with the 'support for research infrastructures' activities of the other thematic programmes.

Full use will be made of the possibilities offered by COST and Eureka, and by cooperation with international organisations, to foster synergy between actions and projects in this programme and nationally funded research activities. In the case of cooperation with Eureka, projects corresponding to themes of common interest with the framework programme may be developed in the context of the key actions, in conformity with the selection criteria and procedures of the framework programme.

(a) KEY ACTIONS

(i) Systems and services for the citizen

Objectives and RTD priorities

The aim of this work is to foster the creation of the next generation of user-friendly, dependable, cost-effective and interoperable general interest services, meeting user demands for flexible access, for everybody, from anywhere, at any time. Work, including the associated education and training, encompasses RTD addressing the whole of the key action, as well as specific RTD in the following fields: health, special needs, including ageing and disability, administrations, environment, and transport and tourism. Certain of the ubiquitous issues addressed throughout the whole of this programme will be taken up further in order to pay due consideration to the needs and expectations of the typical users in this key action, in particular the usability and acceptability of new services, including the security and privacy of information and the socioeconomic and ethical aspects.

— *Health*

Work will cover new generation computerised clinical systems, advanced telemedicine services and health network applications to support health professionals, continuity of care and health-service management, and intelligent systems allowing citizens to assume greater participation and responsibility for their own health.

RTD priorities: professional healthcare: systems enhancing the ability of healthcare professionals, for prevention, diagnosis, care and rehabilitation, such as intelligent systems for non-invasive diagnosis and therapy, intelligent medical assistants, and advanced medical imaging; advanced telemedicine applications; 'virtual healthcare facilities' offering single-point-of-entry services; high-speed secure networks and applications for linking emergency services, hospitals, laboratories, pharmacies, primary care and social centres and the home for continuity of care; health service workflow management and re-engineering; new generation electronic health records and cards for sophisticated health-data objects; personal health systems: affordable and user-friendly systems for personal health monitoring and fixed or portable prevention systems, including advanced and affordable sensors, transducers and micro-systems; personal medical advisors for supervision of prevention and treatment; tele-systems and applications for supporting care in all contexts; user-friendly and certified information systems for supporting health education and health awareness for citizens; the work will be complemented by take-up actions including validations and assessments, together with first-user actions and other best-practice initiatives,

— *Persons with special needs, including the disabled and the elderly*

Work will address person/system interfaces and adaptive and assistive systems to overcome problems caused by environmental barriers and by physical or intellectual impairments, as well as intelligent systems and services to support autonomous living, social integration and participation in the information society.

RTD priorities: 'design-for-all' products, systems and services, including improved participatory design methods, multimodal terminals and universal interfaces; adaptive systems: communication tools for persons with special requirements, mobility support devices, both at home or in the wider environment, robotics control systems; multimedia applications for supporting daily living and social integration at home, work, education, transport, leisure, etc., social support and intervention networks, new methods of service delivery; take-up: a key aspect will be validations and demonstrations,

— *Administrations*

Work will focus on multimedia systems and services addressing the specific needs of all types of administrations (e.g. Community, national, regional, local), in particular to support the widening

and deepening of the EU, and offering interactive services to citizens and/or making them available at natural meeting-points for people, especially in remote and rural areas. Attention will be paid to improving effectiveness and internal efficiency.

RTD priorities: technologies and systems for on-line support for the democratic process and for improved, distance- and language-independent, easy to use and affordable access to information and services, in order to support one-stop service access and transaction handling for citizens and businesses; multilingual personalised services and intelligent multifunctional systems facilitating interaction between citizens and administrations, including the development of virtual fora (public hearings, opinion polling, etc.); systems and tools for enabling statistics to play their role in enhancing the transparency and accessibility of administrations and for promoting multimedia data interchange between administrations; the innovative applications to support the adaptation of administrations to the information and processing systems needs of Community policies; take-up: best practice and other take-up measures will be a priority,

— *Environment*

Work will focus on new generation monitoring, forecasting and decision-support systems and services, addressing both external and internal environments, for administrations, industries and the public, together with advanced systems and services for the identification, assessment, monitoring and prevention of risks, and for the management and mitigation of emergencies, both natural and man-made (including anti-personnel landmines).

RTD priorities: monitoring, forecasting and decision support: intelligent information systems on air/water/soil quality and for monitoring and management of natural resources; advanced systems for water/air/sea/soil/waste pollution monitoring, prevention and warning; low-cost distributed surveillance systems; high-performance systems and advanced tools for environmental data fusion, data mining and modelling, including geo-referenced data; integrated information tools and support systems for sustainable development and to improve ecological and resource efficiency; risks and emergencies: advanced management systems exploiting satellite imagery, remote sensing, sensor systems, real-time systems, and communication networks; take-up: a key aspect will be validations and demonstrations,

— *Transport and tourism*

Work will address IST development, validation and demonstration of intelligent infrastructure and vehicle systems for the management of all modes of transport, including for intermodal operations and 'mobility chains' for freight and passengers, for safety and operational efficiency in all modes, supporting, *inter alia*, actions in 'Promoting competitive and sustainable growth', as well as for information, mobility and tourism related systems and services.

RTD priorities: surveillance, positioning and guidance systems and the necessary enhancement of terrestrial and satellite communication and positioning infrastructures, fixed, on-board and portable interactive multimedia devices, and tele-payment systems, in particular for traffic and demand management, collective and individual transport, fleet and freight operations supporting the whole logistics chain, and user information; new traffic control systems with advanced interfaces, simulation and prediction tools, including systems for managing large-scale events and crises; on-board human-centred systems, including links with complementary telematics systems, for safety and efficiency, including vision enhancement, driver impairment watch, obstacle detection and advanced warning, crash-avoidance, and systems ensuring compliance with regulations (e.g. speed limits); telematic systems for intelligent vehicle operations in all modes of transport; on-board 'info-mobility' services, including 'infotainment'; multimedia personalised information systems for the transport and tourism sectors, including telereservation and telepayment, systems and services addressing weather, leisure and tourism; decision support systems for increased efficiency and planning in the tourism sector; virtual mobility services; take-up: assessment of economic and technical viability, qualification actions, together with best practice actions.

(ii) New methods of work and electronic commerce

Objectives and RTD priorities

The aim of this work is to develop information society technologies to enable European workers and enterprises, in particular SMEs, to increase their competitiveness in the global marketplace, while at the same time improving the quality of the individual's working life, through the use of information society technologies to provide the flexibility to be free from many existing constraints on both working methods and organisation, including those imposed by distance and time. Specific attention will be paid to the social implications of new working methods, in particular their impact on equal opportunities and quality of life. It covers both the development and the trading of goods and services, in particular in the electronic marketplace, and takes into account the different requirements and capabilities of the individual worker, consumer and of businesses and organisations, and includes the related training. Considerations of the global context, in particular the rapid evolution of the marketplace, and socioeconomic factors will guide the work, and the objective will be to develop and demonstrate world-best work and business practices, exploiting European strengths such as electronic payments, smart cards, mobile systems, software for business process modelling and enterprise management and consumer protection.

— *Flexible, mobile and remote working methods and tools*

Work will focus on enabling, validating and demonstrating competitive, flexible and human-centred work methods and organisation, including in administrations and non-profit organisations, by means of an integrated approach to the combination of business process and work organisation, human resource management, and information society technologies, informed by socioeconomic and legal requirements analysis and considerations of the global context and actual business practice. It will address the needs of workers, enterprises and consumers alike. Best-practice pilots and scaleable demonstrations, together with dissemination actions to stimulate broad experimentation, and adoption will be major features of the work.

RTD priorities: work methods: telework and networked cooperative working; mobile working; simulation- and virtual-reality-based methods, for both individual and collaborative working; entrepreneurship and portfolio working; organisation: integrating new or re-engineered work methods and structures in all sectors, including administrations, taking into account existing practices; agile, extended, virtual enterprises and networks of individuals; management and integration of workflow; organisational methodologies, including connected intelligence, benchmarking and scenario planning; transformation methods and change and risk management; socioeconomic issues (including the necessary statistical methods and tools): analysis of change; human resources and training; human factors, usability, health effects and ergonomics and safety in the workplace; implications for and coherence with the legal and regulatory framework; the work will be complemented by take-up actions including validations and assessments, together with first-user actions and other best-practice initiatives,

— *Management systems for suppliers and consumers*

Work will focus on seamless end-to-end support, covering both tangible and intangible products, for electronic trading and distributed virtual enterprises and marketplaces. It will cover applications or systems for interactions within and between consumers, individual entrepreneurs, businesses and administrations. It will address both business and work processes covering the full value chain and the information society technologies needed to support them.

RTD priorities: information society technologies systems to address processes in development, including: life-cycle support, design, engineering, manufacturing and maintenance, logistics and distribution management, quality control, productivity measurement; systems to address processes in marketing and sales, including: customer interaction, negotiation and contracting, mass customisation, packaging and trading; systems to address processes in financial management, incorporating support for the euro, including: ordering, billing and payment, accounting and taxation; public and private procurement; systems to address processes in management, including: decision support and planning; virtual and real marketplace management systems; systems for

on-line business information search and management, including directories and catalogues; systems to address consumer processes, including: product and service selection and purchase; systems for supporting the protection of consumers' rights; take-up: best practice and other take-up measures; work will be complemented by validation and assessment in trials, and by concertation measures to contribute to standards,

— *Information and network security and other confidence-building technologies*

Work will focus on technologies to boost trust and confidence in the information infrastructure, and in its services and information resources, as being reliable, efficient and user-friendly for new methods of work and doing business. This includes protecting information integrity, managing intellectual property rights, enhancing privacy and techniques for combating computer crime, complementing the work carried out in the key action 'Essential technologies and infrastructures'.

RTD priorities: electronic signature, certification and authentication techniques; representation of product data; prevention of fraud and misrepresentation of goods; electronic IPR management technologies; privacy enhancing technologies, including those avoiding the improper collection, recording and disclosure of personal and business data; secure electronic transactions and payments, including anonymous ones and integrating next-generation smart-cards; critical systems management and reliable next generation electronic commerce infrastructures; support for the development of and conformance to the legal and regulatory framework; technologies to generate confidence in meaningfully managing vast amounts of data by businesses and consumers, including user customisation; take-up: technology assessment, trials, demonstrators for building confidence and concertation for ensuring interoperability and contributing to internationally recognised standards.

(iii) **Multimedia content and tools**

Objectives and RTD priorities

The aim of this work is to improve the functionality, usability and acceptability of future information products and services to enable linguistic and cultural diversity and contribute to the valorisation and exploitation of Europe's cultural patrimony, to stimulate creativity, and to enhance education and training systems for lifelong learning. Work will cover new models, methods, technologies and systems for creating, processing, managing, networking, accessing and exploiting digital content, including audiovisual content. An important research dimension will be new socioeconomic and technological models for representing information, knowledge and know-how. The work will address both applications-oriented research, focusing on publishing, audiovisual, culture and education and training and generic research in language and content technologies for all applications areas, and will include validation, take-up, concertation and standards.

— *Interactive electronic publishing and digital heritage and cultural content*

For interactive electronic publishing, work will focus on new publishing and media paradigms for both commercial and private use (including the evolution of the world wide web). It will address future publishing systems able to handle new combinations of content and to provide users with new levels of interaction and control, and cover new forms of content such as virtual objects, in multiuser environments, or immersive, animated content. Three fast-evolving application areas will be addressed: knowledge publishing, in particular for scientific and business content; lifestyle publishing, in particular for news, entertainment and information for the citizen; and geographic and statistical information, including related socioeconomic information, particularly where complex information needs new presentation forms for the non-specialist user. The work on digital heritage and cultural content will aim to improve access to cultural patrimony, facilitate its

valorisation and stimulate cultural development by expanding the key contribution of libraries, museums and archives to the emerging 'culture economy', including economic, scientific and technological development. Actions will particularly address new digital processes and cover business and economic models, especially those which stimulate new partnerships through networking and new services for the citizen.

RTD priorities:

- for interactive electronic publishing: generating creative content through advanced tele-collaborative real-time authoring and design systems and skills development (for example for 3D or virtual reality design and conceptual modelling); systems for the generation and reuse of content from different media; collaborative creative expression and publishing; managing digital content by supporting distributed and networked content; processing large sets of data in innovative ways (e.g. visualisation, scenario development or spatial analysis); devising new metrics for valuing information assets; personalising content delivery (via push or pull technologies), by cost-effective content packaging, advertising and transactions, customer profiling and individualised design and presentation (in a manner that respects the user's right to privacy); exploring the limits between domain-specific and domain-independent content; the work will be complemented by take-up actions including validations and assessments, together with first-user actions and other best-practice initiatives,
- for digital heritage and cultural content: integrated and improved access to heterogeneous distributed and networked collections and repositories and the information they hold, in digital and traditional form (e.g. library holdings, museum exhibition material, public archive contents, multimedia art or sound archives, digital film collections and digital cinematic distribution networks); improving the functionalities of large-scale repositories of content by providing rich and powerful interactive features and advanced management and copyright techniques; preservation of and access to valuable multimedia content from multiple sources, covering electronic materials and electronic surrogates of fragile physical objects; take-up: a key aspect will be validations and demonstrations,
- *Education and training*

Work will aim at providing the EU with a blueprint for a seamless and cost-effective implementation of advanced technologies for enhancing both education and training systems. This work will focus on the common needs of different teaching and learning processes, on new approaches to lifelong learning, and on innovative ways of integrating multimedia pedagogic material.

RTD priorities: improving the learning process through more autonomous and more individualised learning: work will include local learner support, peer learning, remote tutoring, curriculum/course design systems, and accreditation systems; developing higher quality learning material by improving the quality of the content itself, the embedded pedagogical or didactic approaches, and the adaptability to learner needs: work will address new instructional design tools, learner modelling techniques, modelling methods for knowledge transfer, including connected intelligence, as well as learning ergonomics, and will cover content ranging from simple hypermedia to advanced simulations; broadening access to learning resources and services for all: work will address common platforms allowing full access to services across heterogeneous networks, including harmonised identification and retrieval of knowledge resources; and take-up actions,

- *Human language technologies*

Work will focus on advanced human language technologies enabling cost-effective interchanges across language and culture, natural interfaces to digital services and more intuitive assimilation and use of multimedia content. Work will address written and spoken language technologies and their use in key sectors such as corporate and commercial publishing, education and training, cultural heritage, global business and electronic commerce, public services and utilities, and special-needs groups. Work will also include the development of electronic language resources in standard and re-usable formats.

RTD priorities: adding multilinguality to systems at all stages of the information cycle, including content generation and maintenance in multiple languages, localisation of software and content, automated translation and interpretation, and computer-assisted language training; enhancing the natural interactivity and usability of systems where multimodal dialogues, understanding of messages and communicative acts, unconstrained language input-output and keyboard-less operation can greatly improve applications; enabling active assimilation and use of digital content, where work will apply language-processing models, tools and techniques for deep information analysis and metadata generation, knowledge extraction, classification and summarisation of the meaning embodied in the content, including intelligent language-based assistants; the work will be complemented by take-up actions including validations and assessments, together with first-user actions and other best-practice initiatives,

— *Information access, filtering, analysis and handling*

Work will focus on advanced technologies for the management of information content to empower the user to select, receive and manipulate (in a manner that respects the user's right to privacy) only that information required when faced with an ever increasing range of heterogeneous sources. Improvements in the key functionalities of large-scale multimedia asset management systems (including the evolution of the world wide web) will support the cost effective delivery of information services and their usage.

RTD priorities: mastering information: rich descriptive models of digital information content, covering all media types and supporting all human senses, in addition to spatial and temporal aspects; associated tools to enable users to develop information profiles, possibly based on vague concepts and enabled via personalised agents; radically new cognitive relations between the system and users via individualised metaphors or visualisation techniques; information management systems: new organisation and management methods for multimedia information sources: work will explore advanced techniques for data warehousing integrating access control mechanisms, quality assurance, integrity control and technical protection of multimedia 'fragments'; information categorisation, labelling and filtering enabling selective information retrieval (including navigation and search based on non-textual information) and filtering (including for the control of illegal and harmful content); take-up: first-user and other take-up measures; work will be complemented by validation and assessment in trials, and by concertation measures to contribute to standards.

(iv) **Essential technologies and infrastructures**

Objectives and RTD priorities

The aim of this work is to promote excellence in the technologies which are crucial to the information society, to accelerate their take-up and broaden their fields of application. The work will address the convergence of information processing, communications and networking technologies and infrastructures. The focus will be on technologies and infrastructures common to several applications, while those specific to one application only would be addressed in the context of that application in other parts of the framework programme.

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

The work will focus on the development and convergence of information processing, telecommunications and broadcast network and system technologies.

RTD priorities: concurrent systems: technologies and tools for the sharing and interactive use of remote resources and concurrent activities in geographically dispersed locations, in the context of heterogeneous hardware and software architectures and systems; real-time systems handling large volumes of data; basic technologies and tools supporting real-time embedded systems applications, related work should actively contribute to, or adhere to, standards; broadband telecommunications

networks: reliable high capacity terabit optical transmission; a major effort in photonic technologies for end-to-end optical transparency in core and access networks; technologies and architectures, including specifically all-optical networks: topological and functional layout, switching and routing, operation and management; technologies for network integration (notably for the convergence of fixed and mobile, including satellite, networks) and new service independent architectures and systems, to ensure all users have affordable access to broadband multimedia nomadic services; interoperability and interworking of networks particularly at the network management and service levels, to increase capacity, flexibility and functionality and to promote the introduction of competition and new intelligent network services (including the evolution of the Internet); generic service methodologies and tools capable of handling the increased network complexity, new architectures and the requirements for end-to-end 'quality of service', and network dependability and security; take-up: measures to promote and transfer best practice, for concertation to contribute to standards, and to test and validate technologies and services in field trials,

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

Work will centre around the development, deployment, operation and evolution of software-intensive systems embedded in goods and services as well as facilitating production and enterprise processes, including technologies and tools for testing and validation at all stages.

RTD priorities: software and systems engineering: work will focus on dependable, survivable and scaleable systems and address the reduction of the development cycle and costs; the use and further development, as required, of reliable methods and tools will be a central issue; software modularity, in particular the integration of custom and off-the-shelf components into systems, will be a key aspect; service engineering will address the integration of heterogeneous platforms and networks and the increasing complexity and sophistication of the new services and their creation and provision, the objective will be to develop technologies and tools for rapid, customised and cost-effective service creation, deployment, provision and management that provide for an open information and communications service infrastructure, with the necessary reliability, security and quality of service; software technologies work will foster knowledge-based methods and tools, which increase the usability as well as the capability of systems and the intelligence in the network, this includes the timely collection, production, dissemination and communication of high-quality information (including statistical and management information); take-up: best practice and other take-up measures will be a priority; work will be complemented by the validation and assessment of technologies, systems and services in field trials, and by concertation measures to contribute to standards,

— *Real-time and large-scale simulation and visualisation technologies*

Work will address the development and integration of advanced simulation and visualisation technologies and environments in all applications. Work will include distributed simulations and shared virtual environments.

RTD priorities: simulation and visualisation: work on simulation environments will include pre-processing, advanced post-processing (including visualisation and virtual reality) and tools for the validation of simulation with experimental and archival data; tools to support the integration of simulation in industrial and business processes will be a priority; technologies and tools for distributed simulations with emphasis on support for the interoperability of heterogeneous software and hardware systems; shared virtual environments scaleable over large networks; population with autonomous agents and visualisation, such as through avatars; the work will be complemented by take-up actions including validations and assessments, together with first-user actions and other best-practice initiatives,

— *Mobile and personal communications and systems, including satellite-related systems and services*

Work will target the move to an integrated seamless network that ensures global personal connectivity and enables access to wireless multimedia communications and services by anyone, from anywhere, at any time, with capabilities, quality and performance comparable to those of fixed network services.

RTD priorities: work will focus on the development and evolution of new generations of affordable terrestrial and satellite broadband wireless architectures, systems and technologies, exploiting new spectrum frontiers, for both private and public environments, supporting advanced services and maximising spectral efficiency and network performance; addressing full coverage through a multiplicity of radio systems deployed in a multilayer, multidimension cell architecture; service mobility and terminal roaming across terrestrial and satellite wireless and wired networks will be a priority; software reconfigurable networks, systems and terminals, to facilitate improved network planning, interoperability and interworking; miniaturised, low-cost, low-power mobile and portable communication terminals (both hardware and software aspects); technologies, services and applications supporting interactive mobile and personal multimedia services, with regional or global coverage and integrated where appropriate with terrestrial and satellite navigation services; take-up: a key aspect will be validations and demonstrations of broadband interactive mobile multimedia technologies and services; a major effort will be dedicated to technology assessment and concertation measures to contribute to standards,

— *Interfaces making use of the various senses*

Work will address the provision of intuitive ways to capture, deliver and interact with systems. Work will include the development and integration of advanced sensor, actuator and display technologies.

RTD priorities: multimodal, multisensory interfaces and novel tools and devices, validation and assessment will be central to this work; technologies including image and auditory scene processing, understanding and synthesis will be developed and integrated to provide new solutions for the work and leisure/entertainment environments; the work will facilitate the introduction of technologies such as augmented and virtual reality; the development and integration of a range of advanced display technologies for professional and consumer applications will be addressed; emphasis will be given to the development of low-cost and low-power interfaces, as well as the use of new flexible materials for portable and mobile subsystems; included are issues such as user adaptability, knowledge on the health effects, user interaction modelling and profiling; take-up will be stimulated, in particular, by first-user actions,

— *Peripherals, sub-systems and microsystems*

Work will address the need for advanced intelligent (computing and communications) network peripherals which can have multiple functionality yet remain user-friendly. Work on subsystems will cover the building blocks of information processing and communications systems and networks. Work on intelligent microsystems will, in this context, cover miniaturised systems comprising sensing and/or actuating with processing functions, and normally combining two or more of electrical, mechanical, optical, chemical, organic, biological, magnetic or other properties, integrated onto a single chip or a multichip hybrid.

RTD priorities: integration, low-power consumption and miniaturisation will be the drivers for technology development for peripherals and terminals, integrating advanced display technologies, as well as software and hardware modules for content capture, storage and manipulation; the development of advanced mass storage methodologies is a key requisite; subsystems: in addition to basic building blocks a major focus will be home systems; microsystems work will be concentrated on facilitating the broader application of intelligent microsystems, primarily for the medical, biochemical, environmental, automotive and aerospace applications, as well as their use in measurement and control systems or subsystems; the primary aim is to transfer competence from research to industrial use and to facilitate access to existing technologies for prototyping and small volume production; the integration of optical interconnects into microelectronic subsystems and microsystems for high-performance applications (e.g. electro-optical circuit boards); the work will be supported through measures complementing those in 'Promoting competitive and sustainable development' addressing the manufacturability of intelligent microsystems and the associated assembly, interconnect, packaging, materials and equipment technologies, together with support for the appropriate design and simulation activities; take-up: the work will be complemented by concertation for coordination and to contribute to standards, and in particular for microsystems by first-user actions,

— *Microelectronics*

Work will address materials, equipment, processes, design and test methodologies and tools which enable the development of electronic components, their packaging, interconnection and

application. The approach will be system-oriented and application-driven, and will aim at reinforcing strengths and exploiting technological opportunities drawing on appropriate microelectronic technology solutions best filling generic application requirements.

RTD priorities: application and hardware/software co-design methods and tools; the key technology requirements will be addressed through support for semiconductor materials and equipment development and assessment, packaging and interconnect technology, notably for the most advanced generations; the focus will be on broadening applicability through the development of cost-effective active and passive silicon, silicon-based, or compound semiconductor components and subsystems for applications with generic characteristics, in particular mobility (low power, high frequency wireless communications), high complexity/high performance systems, systems resistant to hostile environments in terms of reliability and endurance, measurement and control; the development, integration or customisation of advanced signal and data processing functions into subsystems together with their associated memory and input/output functions will be a priority, together with macrocells and support tools for classes of applications; optical technologies: new optical sources, optoelectronic integrated circuits, active and passive optical components and devices at new wavelengths, including optoelectronic devices based on organic compounds; take-up: promotion of application and design competencies will be addressed in thematic clusters; a major effort will be devoted to technology assessment, first-user and other best-practice measures.

(b) RESEARCH AND TECHNOLOGICAL DEVELOPMENT ACTIVITIES OF A GENERIC NATURE

FUTURE AND EMERGING TECHNOLOGIES

This specific activity on future and emerging technologies will cover research that is of a longer-term nature or involves particularly high risks — compensated by the promise of major advances and the potential for industrial and societal impact. Such research will typically be either transdisciplinary or in an emerging discipline. It will reinforce the link and flow of ideas, initiatives and people between academia and industry in the EU. This activity complements the domain-specific work integrated in each of the key actions.

To ensure a seamless coverage of the information society technologies the door needs to be kept open to any new idea with a potential industrial or societal impact, in the bottom-up fashion. This openness will need to be reinforced in specific areas with highly focused well-coordinated proactive initiatives of a strategic nature. Flexibility is essential just as is an appropriate balance between proactive initiatives which need careful, but rapid, planning on the one hand and, on the other hand, openness to new highly promising ideas as they arise.

The open domain

By definition the topics addressed cannot be prescribed. Project proposals could include, in a non-prescriptive way, knowledge technologies (covering technologies for the representation, creation and handling of knowledge), technologies for computation- or bandwidth-intensive applications, future devices and circuits (including those based on nano, quantum, photonic or bio-electronic effects and technologies for very large scale integration), and ultra-complex systems (such as ultra-high performance computers and super-intelligent networks).

Proactive initiatives

Complementing the open domain, a number of proactive initiatives having a strategic perspective and addressing areas of substantial future growth, where close coordination across different projects is necessary, will be defined in the course of the execution of the programme. The definition of topics will be based on their potential for long-term industrial and societal impact (including employment through 'start-ups'), on the opportunity offered by scientific advances or a combination of both. The planning of the proactive initiatives will need to make allowance for the necessity to be able to react rapidly if windows of opportunity present themselves unexpectedly through scientific advances.

Initiatives will each consist of a set of autonomous but closely coordinated and appropriately networked projects. The networked nature of the initiative could be reinforced with some central research facilities when these provide economies of scale to the participants of multiple projects. For example, experimental shared nano-fabrication facilities, model spaces or communities for experiments in the areas of interfaces or virtual reality, and so forth.

The actual choices will be made at appropriate times through consultations with the research community, following the setting of an agenda that draws on a very broad body of scientific and technological opinion. In this context, advance knowledge will be sought through a combination of a series of strategic workshops, aimed towards setting trends and research targets, and a technology-watch activity, to be carried out in close cooperation with other actors in the field, including the JRC's Institute for Prospective Technological Studies and the Scientific and Technological Options Assessment Unit of the European Parliament where appropriate.

(c) SUPPORT FOR RESEARCH INFRASTRUCTURES

RESEARCH NETWORKING

Broadband interconnection of national research and education networks

The objective is to facilitate the supply of trans-European broadband interconnections between national research, education and training networks at capacities and of a quality matching the aggregated need of Europe's academic and industrial researchers and to keep the resulting network at the forefront of the state of the art. This implies an upgrading of the existing capacity of 34 Mbits/s via 622 Mbits/s to several gigabits/s, including support for different levels of 'Quality of service' and the necessary connectivity to third countries, in the context of the global evolution of the Internet. Upgrading the network will proceed in line with proven demand. The aim is to facilitate effective European collaborative research, education and training activities (including the creation of 'virtual laboratories' and 'virtual institutes'), enabled by the deployment of state of the art Internet-based applications within the academic and industrial research communities. This work will support research in all fields and therefore the whole framework programme.

Advanced European experimental testbeds

The objective is the integration of leading-edge collaborative research and development, demonstration and take-up activities, from all key actions in this programme, addressing future generations of communication technologies, protocols, services and distributed applications. This experimental interconnection of the testbeds of individual operators, industries, universities and research facilities in Europe (together with necessary connections to third countries) will provide a practical basis for collaborative research efforts (e.g. in photonic networks, service configuration protocols or mobile broadband services). It will also lead to the early availability of the most advanced infrastructure of all types, which will in turn allow for early experiments with advanced applications (e.g. remote high-volume data visualisation, meta-computing or networked immersive virtual reality) requiring very high bandwidth or new services. It will also enable Europe to play a leading role in defining, standardising and validating the next generations of network protocols (including those for the Internet) and other emerging broadband services. It will contribute to the long-term interoperability and seamlessness of advanced network infrastructures, services and applications.

*ANNEX III***SPECIFIC RULES FOR IMPLEMENTING THE PROGRAMME**

The specific programme will be implemented through the indirect RTD actions as provided for in Annexes II and IV to the fifth framework programme. In addition, the following rules specific to this programme will apply:

1. Accompanying measures

The accompanying measures will comprise in particular:

- take-up measures, including trials, best practice actions, first user actions, assessment and qualification actions and other actions aimed at stimulating broad take-up, particularly in SMEs, and encouraging innovation,
- measures in support of standardisation and other measures aimed at usability, interoperability and dependability of information and communication technologies, systems applications and services,
- measures in support of the interconnection of research infrastructures and other installations needed for RTD,
- studies in support of the specific programme, including the preparation of future activities,
- exchanges of information, conferences, seminars, workshops or other scientific and technical meetings and the management of clustered RTD activities,
- recourse to external expertise, including access to scientific databases, in particular for the purposes of the monitoring of the specific programme provided for in Article 5(1) of the fifth framework programme, the external assessment provided for in Article 5(2) of the fifth framework programme and the evaluation of indirect RTD actions and the monitoring of their implementation,
- analyses of the socioeconomic consequences associated with information society technology developments,
- dissemination, information and communication activities, including scientific publications, activities for the exploitation of results and the transfer of technologies, encouragement of innovation financing and assistance with the protection of intellectual property,
- training schemes related to RTD activities covered by the specific programme other than Marie Curie fellowships,
- support for schemes to provide information and assistance for research players, including SMEs,
- recourse to external expertise in setting up and providing access to information, assistance and research and innovation promoting services and networks.

In line with Annex IV to the fifth framework programme, the Community contribution for the measures set out under the first indent above, and which are not the subject of procurement, may be up to 100% of the eligible costs. However, on the basis of the principle of sound and efficient financial management, the Community financial contribution may be limited, for certain actions or measures, to 100% or less of those cost categories deemed necessary or appropriate for achieving the specific objectives of the action.

2. Coordination arrangements

The Commission will endeavour to ensure complementarity between the indirect RTD actions under the programme, in particular by grouping them around a common objective, and to avoid duplication, while respecting the legitimate interests of proposers of indirect RTD actions.

As far as possible, coordination will also be ensured between actions under the specific programme and those carried out in:

- other specific programmes implementing the fifth framework programme,
- the research and training programmes implementing Council Decision 1999/64/Euratom of 22 December 1998 concerning the fifth framework programme of the European Atomic Energy Community (Euratom) for research and training activities (1998 to 2002)⁽¹⁾,
- other European research frameworks including Eureka and COST,
- other Community research-related instruments.

It will comprise:

- (i) the identification of common themes or priorities, resulting in particular in:
 - the exchange of information,
 - the carrying out of work decided on jointly, entailing in particular the joint initiation of one of the procedures referred to in Article 9 of the rules for participation and dissemination;
- (ii) the reassignment of proposals for indirect RTD actions between specific programmes or between a specific programme and a research and training programme.

⁽¹⁾ OJ L 26, 1.2.1999, p. 34.

COUNCIL DECISION

of 25 January 1999

adopting a specific programme for research, technological development and demonstration
on competitive and sustainable growth (1998 to 2002)

(1999/169/EC)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 130i(4) thereof,

Having regard to the proposal from the Commission⁽¹⁾,

Having regard to the opinion of the European Parliament⁽²⁾,

Having regard to the opinion of the Economic and Social Committee⁽³⁾,

(1) Whereas by Decision No 182/1999/EC⁽⁴⁾, the European Parliament and the Council adopted the fifth framework programme of the European Community (hereinafter referred to as the fifth framework programme) for research, technological development and demonstration (hereinafter referred to as RTD) activities for the period 1998 to 2002 setting out the general outlines and scientific and technological objectives of the activities to be carried out in the field of competitive and sustainable growth;

(2) Whereas Article 130i(3) of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity under the framework programme, and that each specific programme shall define the detailed rules for implementing it, fix its duration and provide for the means deemed necessary;

(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⁾ and Article 4(2) of the Council Decisions on the specific programmes implementing the fourth framework programme, the Commission has arranged for an external assessment to be conducted which it has transmitted to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions together with its conclusions and comments;

(4) Whereas, in accordance with Article 130j of the Treaty, Council Decision 1999/65/EC of 22 December 1998 concerning the rules for the participation of undertakings, research centres and universities and for the dissemination of research results for the implementation of the fifth framework programme of the European Community (1998 to 2002)⁽⁶⁾ (hereinafter referred to as 'the rules for participation and dissemination') applies to this specific programme; whereas these rules allow the participation of the Joint Research Centre in the indirect actions covered by this specific programme;

(5) Whereas, for the purpose of implementing this programme, in addition to cooperation covered by the Agreement on the European Economic Area or by an Association Agreement, it may be appropriate to engage in international cooperation activities, in particular on the basis of Article 130m of the Treaty, with third countries or international organisations;

(6) Whereas implementation of this programme will also comprise activities and mechanisms aimed at stimulating, disseminating and exploiting RTD results, in particular *vis-à-vis* small and medium-sized enterprises (SMEs), and activities to stimulate the mobility and training of researchers;

⁽¹⁾ OJ C 260, 18.8.1998, p. 33.

⁽²⁾ Opinion delivered on 15 December 1998 (not yet published in the Official Journal).

⁽³⁾ OJ C 407, 28.12.1998, p. 123.

⁽⁴⁾ OJ L 26, 1.2.1999, p. 1.

⁽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).

⁽⁶⁾ OJ L 26, 1.2.1999, p. 46.

- (7) Whereas it is important that the scientific, industrial and user communities should contribute substantially to the definition of activities to be undertaken and should be involved, as appropriate, in the implementation of this programme;
- (8) Whereas research activities under the fifth framework programme should also be geared towards innovation in order to contribute, *inter alia*, to the objectives of the first action plan for innovation;
- (9) Whereas special emphasis should be placed on encouraging the participation of SMEs;
- (10) Whereas the equal opportunities policy of the Community must be taken into account in the implementation of this programme;
- (11) Whereas efficient and transparent management contributes to a more effective and user-friendly programme;
- (12) Whereas administrative expenditure should be included in the Community budget in a transparent fashion;
- (13) Whereas the implementation of this programme should be monitored with a view to adapting it, where appropriate, to scientific and technological developments; whereas in due course there should also be an assessment of progress with the programme by independent experts;
- (14) Whereas the Scientific and Technical Research Committee has been consulted on the scientific and technological content of the specific programmes,

HAS ADOPTED THIS DECISION:

Article 1

In accordance with Article 3(1) of the fifth framework programme on competitive and sustainable growth (hereinafter referred to as the specific programme) is adopted for the period from 25 January 1999 to 31 December 2002.

Article 2

1. In accordance with Annex III to the fifth framework programme, the amount deemed necessary for carrying out the specific programme is EUR 2 705 million, including a maximum of 6,5 % for the Commission's administrative expenditure.

An indicative breakdown of this amount is given in Annex I.

2. Of the amount in paragraph 1

— EUR 646 million is for the period 1998 to 1999,

and

— EUR 2 059 million is for the period 2000 to 2002.

In the case referred to in Article 2(1)(c) of the fifth framework programme, the Council shall adapt the latter figure in accordance with Article 2(1)(c), second indent of the fifth framework programme. Pending a decision by the Council, this specific programme shall not be implemented beyond the provision of the first indent.

3. The budgetary authority shall, in compliance with the scientific and technological objectives and priorities laid down in this Decision, set the appropriations for each financial year taking into account the availability of resources within the multiannual financial perspective.

Article 3

1. The general outlines, the scientific and technological objectives and the priorities for the specific programme are set out in Annex II. They are consistent with the principles and the three categories of selection criteria indicated in Annex I to the fifth framework programme.

2. In accordance with these principles and criteria the selection criteria indicated in Article 10 of the rules for participation and dissemination shall be applied for the selection of the RTD activities to be carried out.

In addition, any participation of industrial entities in industrially-orientated shared-cost actions should, as a general rule, be appropriate to the nature and purpose of the activity.

All these criteria shall be complied with in the implementation of the programme, including the work programme referred to in Article 5(1), although they may be weighted differently.

3. The rules for participation and dissemination shall apply to the specific programme.

4. The detailed rules for financial participation by the Community in the specific programme are those referred to in Article 4 of the fifth framework programme.

The indirect RTD actions under the specific programme are defined in Annexes II and IV to the fifth framework programme.

Specific rules for implementing the programme are set out in Annex III to this Decision.

Article 4

In the light of the criteria referred to in Article 3, and the scientific and technological objectives and priorities set out in Annex II, the Commission:

- (a) shall monitor, with appropriate assistance from independent external experts, the implementation of the specific programme and, where appropriate, submit proposals to Council for adapting it, in accordance with Article 5(1) of the fifth framework programme;
- (b) shall arrange for the external assessment provided for in Article 5(2) of the fifth framework programme to be conducted concerning the activities carried out in the fields covered by the specific programme.

Article 5

1. The Commission shall draw up a work programme specifying:

- (a) in greater detail, the objectives and RTD priorities of Annex II;
- (b) the indicative timetable for the implementation of the specific programme;
- (c) the coordination arrangements set out in Annex III and arrangements to secure the objectives, related to innovation and the participation of SMEs, of the third activity of the fifth framework programme;

(d) where necessary, the selection criteria and the arrangements for applying them for each type of indirect RTD action.

2. The work programme shall take account of relevant interests, in particular the scientific, industrial and user communities. It shall serve as a basis for implementing the indirect RTD actions according to the procedures set out in the rules for participation and dissemination.

3. The work programme shall be updated where appropriate and be made available by the Commission to all interested parties in a user-friendly form, including in electronic form.

Article 6

1. The Commission shall be responsible for the implementation of this specific programme.

2. The procedure laid down in Article 7 shall apply for the adopting of the following measures:

- the drawing-up and updating of the work programme referred to in Article 5(1), including regarding the content of calls for proposals,
- approval of RTD actions proposed for funding, including participation by entities from third countries, where the estimated amount of the Community contribution under this programme is equal to or more than:
 - in the case of key actions (i), (iii) and (iv) EUR 1,5 million,
 - for all other actions EUR 0,75 million,
- the drawing-up of the terms of reference for the external assessment provided for in Article 5(2) of the fifth framework programme,
- any adjustment to the indicative breakdown of the amount as set out in Annex I.

Article 7

1. The Commission shall be assisted by a programme committee (hereinafter referred to as 'the committee') composed of representatives of the Member States and chaired by the representative of the Commission.

2. In the cases referred to in Article 6(2), the representative of the Commission shall submit to the committee a draft of measures to be taken. The committee shall deliver its opinion on the draft measures referred to above within a time limit which the Chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148(2) of the Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The Chairman shall not vote.

3(a) The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee.

(b) If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority.

If, on expiry of a period of nine weeks from the referral of the matter to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

4. The Commission shall regularly inform the committee of the overall progress of the implementation of the specific programme, and shall in particular provide it with information about the progress of all RTD actions funded under this programme.

Article 8

In accordance with Article 5(4) of the fifth framework programme, the Commission shall regularly inform the Council and the European Parliament of the overall progress of the implementation of the programme, including on the participation of SMEs and the simplification of administrative procedures.

Article 9

This Decision is addressed to the Member States.

Done at Brussels, 25 January 1999.

For the Council
The President
J. FISCHER

ANNEX I

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

<i>(million EUR)</i>	
Type of activity	Amount
(a) Key actions	
(i) Innovative products, processes and organisation	731
(ii) Sustainable mobility and intermodality	371
(iii) Land transport and marine technologies	320
(iv) New perspectives for aeronautics	700
(b) Research and technological development activities of a generic nature	546
(c) Support for research infrastructures	37
Total	2 705

ANNEX II

THE GENERAL OUTLINES, THE SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES AND THE PRIORITIES

INTRODUCTION

Competitiveness and sustainability are the keys to the long-term future of the Union's economy: creation of wealth and jobs, enhancement of the quality of life, and preservation of the environment and the natural resource base. They depend on the capacity of citizens, enterprises, regions, nations and the Community to generate and use the knowledge, science and technology of tomorrow, in high-quality goods, processes and services, and in new and more efficient organisational forms. Research activities are clearly crucial in generating a more competitive technological base for European industry and in fostering the transition to a sustainable world, which will involve both a transformation of working practices and an optimised use of resources.

Competitiveness and sustainability can no longer be considered an exclusive matter for individual organisations or sectors alone. In the context of an increasingly interlinked and globalising economy a systems approach is necessary, in which research activities support the development of coherent, interconnected and eco-efficient industrial and social systems, responding not only to market but also to societal needs. At the heart of these systems will be efficient and quality-based production systems, embedded in agile organisations and producing high-quality eco-friendly products and services (in Europe there are more than 2 million industrial enterprises employing more than 40 million people, with 80 million working in related services). These wealth-creating activities should, in turn, be supported by key products and services, including efficient transport systems and clean and safe vehicles, promoting trade and the sustainable mobility of goods and people. Competitive and sustainable growth also depends on the development of quality materials and reliable measurement and testing methods, as well as the optimal use of specific research infrastructures, whether physical or virtual. Such a holistic approach is the best way to improve the long-term efficiency and sustainability of Europe's economic system in the face of world-wide evolving market constraints and socio-environmental responsibility.

Strategic objective of the programme

The objective of this specific programme must be to support research activities contributing to competitiveness and sustainability, particularly where these two objectives interact. In this context, industry's role will be not only to identify areas for collaboration but also to bring together and integrate projects, especially cross-sectoral projects along the value chain, so that technology uptake and innovation are more efficiently ensured across Europe. The development of new concepts such as eco-industry, intermodality, new generations of aircraft and other means of transport, and innovative approaches to the integration of new technologies will help to prepare industrial sectors for the challenges of the new millennium, and to generate a strategic vision of research in all industrial sectors throughout Europe. Research, technological development and demonstration activities will focus on clearly identified needs and on improving the information available to policy-makers about the implications of technological and organisational change. The approach to all these activities will also pay particular attention to the 'innovation' dimension and to stimulating and supporting the involvement of SMEs so as to reduce the gap between the achievement of the research results and their effective use by the economy and society.

Answering socioeconomic needs. By stimulating holistic approaches, by strengthening the innovative capacity of the European industrial system and by fostering the creation of businesses and services built on emerging technologies and new market opportunities, the programme will help face the major challenges of society, in particular employment. In parallel, research into sustainable mobility and environmentally and consumer friendly processes, products and services will contribute to improving quality of life and working conditions.

Stimulating European added-value. Activities to solve the cross-border problems rising in connection with the various key actions have a clear European dimension, as does the development of norms and

standards in support of Community policies. Achieving the critical mass needed to attain concrete and tangible results in cost-intensive technologies will also necessitate mobilising national and other RTD Community resources.

Supporting European competitiveness. Europe suffers from a recognised gap compared with its major competitors, inasmuch as it is less able to translate its scientific knowledge into innovation. Not only research but also innovation in respect of new concepts of products and services, production systems and organisational concepts (e.g. eco-industries) should be fostered to boost competitiveness and productivity.

Ethical framework. Full respect of human rights and fundamental ethical principles will be ensured throughout all activities in the specific programme in accordance with Article 6 of the fifth framework programme.

LINKS AND COMPLEMENTARITY WITH OTHER PROGRAMMES

RTD activities will be integrated and coordinated as necessary, within and between the different key actions and programmes, as well as with the JRC. Appropriate links will be established between these activities. This should provide mechanisms by which industry, public authorities, users and the research community can work jointly on the resolution of common problems, particularly in fields such as intelligent production systems, microsystems, next generation of aircraft and other means of transport or traffic management.

The economic and technological challenge of deploying, adapting and integrating life sciences and technologies related to energy, the environment or the information society is crucial for promoting competitive and sustainable growth. The specific applications meeting this challenge form an integral part of the various activities of this programme and will be conducted in close coordination with the specific programmes concerned.

Particular effort will be undertaken to ensure coordination within this thematic programme and with other thematic programmes, in particular on transport research topics. Coordination with the specific programme on the user-friendly information society is based on the following principle: activities related to information society technologies as such (including development and technology demonstration and assimilation activities) will be concentrated in the user-friendly information society programme, while activities linked to the deployment and integration of these technologies and their adaptation to applications relating to competitive and sustainable growth will be conducted under this programme.

Aspects related with the horizontal programmes are outlined below:

- many of the problems addressed by this programme can only be dealt with effectively in a broader international context. For this reason close coordination will be developed with the programme on confirming the international role of Community research, in particular on issues where world competition is stiff and where major geo-economic challenges are at stake. This is clearly the case for production, transport, maritime, materials and standardisation related research activities, where collaboration with international initiatives (e.g. the Intelligent Manufacturing Systems (IMS) initiative) would bring added-value to European research work. Full use will be made of the possibilities offered by COST and Eureka and by cooperation with international organisations to foster synergy between actions and projects in this programme and nationally funded research activities. In the case of cooperation with Eureka, projects corresponding to themes of common interest with the framework programme may be developed in the context of the key actions in conformity with the selection criteria and procedures of the framework programme. Specific activities aimed at facilitating the involvement of entities in third countries and maintaining links with specialists from third countries trained in Europe will be carried out, which will also contribute to the international dimension of the programme,
- in view of the increasing need to bridge the gap between research results and their potential applications, and of the large number of companies which could be interested in the potential results, particular attention should be paid to activities related to innovation and the participation of SMEs. This will be the case for all activities in this programme (e.g. cooperative research, large industrial projects, support to research infrastructures), and it will be closely coordinated with the

programme on the promotion of innovation and encouragement of participation of SMEs. An innovation cell will centralise promotion activities with a view to the deployment and use of the results of this programme; it will also help ensure complementarity and an interface with the innovation activities pursued under the programme 'Promotion of innovation and encouragement of SMEs participation',

- improving the know-how, skills and qualifications of European researchers and the understanding of the socioeconomic impact of research in the fields covered by this programme is essential to ensure sufficient availability of appropriate expertise and to establish tangible and lasting impacts. Training and socioeconomic research will therefore form an integral part of this programme complemented by appropriate links with the horizontal programme 'Improving the human research potential and the socioeconomic knowledge base'. Training activities in this programme will include support to fellowships, which will take the form of Marie Curie fellowships following the definitions and rules set out in the horizontal programme.

(a) KEY ACTIONS

(i) Innovative products, processes and organisation

Objectives and RTD priorities

The overall goal of this key action is to develop new and improved methods of design, advanced equipment and process technologies for production⁽¹⁾, including innovation in and modernisation of traditional industries, that improve the quality and reduce the costs of processes for services and products (aiming for a substantial improvement in these factors in the medium term), reduce overall life-cycle impacts, improve understanding of 'soft technology' aspects (organisation, management, logistics, teleworking, etc.), so as to integrate them fully into relevant industrial processes, and ultimately contribute to employment growth (aiming at creating and maintaining in Europe a number of jobs comparable, in percentage terms, to those of Europe's major competitors). Implementation of the key action will focus on systemic approaches to production (products, production facilities, processes and organisation) and on clustering and integrating projects into targeted groups, which will make it easier to take account of socioeconomic, ecological and competition aspects. Particular attention will be paid to the involvement of SMEs, taking account of their specific needs and their roles in the supply chain. Where appropriate, research activities will be coordinated with the activities of other programmes in particular the specific programme 'User-friendly information society', and/or implemented in cooperation with international initiatives (IMS, Eureka).

- *Efficient production including design, manufacturing, and control for improved product/service combinations including micro- and nano-scale technologies and engineering*

The aim is to improve competitiveness through increased industrial added-value, quality and responsiveness to market, reduced time-to-market and material intensity.

RTD priorities: technologies for integrated product-service design and development, multi-technology integrated products (including production equipment and facilities) and related manufacturing and production processes; advanced production and construction techniques and equipment for higher process accuracy and reliability; manufacturing and processing technologies and equipment for optimal use of resources and for product miniaturisation, including the manufacture and assembly of microsystems; methods to overcome the barriers between designers and consumers,

- *Intelligent production*

The aim is to optimise the level of performance of all elements of the industrial environment through the development, integration and application of information society technologies in production and related logistic systems.

⁽¹⁾ The term 'production' encompasses all industrial activities from extraction of raw or recycled materials to the processing and manufacture of components and end-products. It covers all industrial sectors and associated services, including construction.

RTD priorities: intelligent and reconfigurable production systems, machinery, and equipment; on-line control using advanced actuators and sensors; extended life and optimal use of production facilities; intelligent operation and maintenance systems, including self-repair; application of advanced technologies for flexible and interoperable supply/production/distribution systems and networks,

— *Eco-efficient processes and design*

The goal is to minimise 'full life-cycle' impacts on the environment, taking account of all essential elements of the industrial system ranging from extraction through production to waste management, with emphasis on resource-intensive processes and reduction and valorisation of waste.

RTD priorities: clean and eco-efficient processing technologies including, where appropriate, use of renewable raw materials; research aimed at mastering basic phenomena such as synthesis, catalysis, separation and reaction mechanisms, process modelling and simulation; impact monitoring and assessment of risks; *in situ* and on-line recovery of unused resources and waste; novel processes for treatment, reuse and safe disposal of waste and for upgrading, reusing or dismantling products and production systems,

— *Organisation of production and work*

The goal is to move towards high performance industrial systems, virtual networks, agile customer-driven networked industrial and related service enterprises, including SMEs, with multi-skilled highly motivated labour force, working in efficient, safe and pleasant workplaces and taking into consideration the diversity and specificity of European society and manufacturing tradition.

RTD priorities: study of human, organisational, socioeconomic and regulatory determinants for a smooth transition of enterprises towards efficient and sustainable production and consumption; new decision-making tools and new approaches to the management of change and human resources covering also work organisation, skill needs and worker's protection; studies on the impact and acceptance of new business ideas, new forms of work and new industrial production patterns, compatible with the concept of sustainability including the interface between society and enterprises.

(ii) **Sustainable mobility and intermodality**

Objectives and RTD priorities

The overall aim of this key action is to achieve a better reconciliation of the growing demand for mobility with the need to respect sustainable use of resources and environmental, social, economic and safety constraints. It will help to break the link between economic growth and increased traffic volumes; reduce the negative impact of transport modes, and encourage their more sustainable use. Particular attention will be paid to intermodality and how best to integrate the respective strengths of the various modes of transport in order to provide user-oriented door-to-door services for both passengers and freight. This should result in a better management of mobility. Activities supported in this key action will be coordinated with activities carried out within other transport-related key actions.

— *Modal and intermodal transport management systems*

The aim is to develop, validate, demonstrate and facilitate the deployment of rational, high-performance transport management systems for air, sea, inland waterway, rail, road and urban transport, both on a modal basis and for integrated intermodal transport, interfacing, *inter alia*, with the possibilities offered by the programme for a user-friendly information society, including the application and validation of related information and related integrated systems to facilitate their deployment.

RTD priorities: development, validation and demonstration of modal and intermodal traffic and transport management systems, including operational, regulatory, administrative and structural

solutions for their deployment, and pricing systems; integration of information and data exchange systems across modes including real-time user information, electronic documentation and user services with transport management and logistics; second generation satellite navigation⁽¹⁾ and positioning systems; improvements to satellite-supported haulage; integration of services such as traffic management, vehicle and freight unit identification, location and guidance, pricing, freight planning, travel information and passenger services within the transport system,

— *Infrastructures and their interfaces with transport means and systems*

The goal is to enhance interconnectivity and interoperability and to promote intermodality in the transport system, through integration of all its components across the modes at the levels of infrastructure, transfer points, transport means, equipment, operations, services and the regulatory framework.

RTD priorities: more efficient use and reduced operating, development and maintenance costs of existing infrastructure; effective interchanges; interconnection between trans-European, national, regional and local networks; innovative infrastructure concepts and operations; relationship between transport, land use, regional planning, environment and health; reduced congestion, resource and energy consumption, pollution, and infrastructure degradation; integration of vehicles and public transport in the transport system; innovative concepts and operations for urban, interurban and rural mobility and intermodality; safety covering all modes of transport, including for the transport of dangerous goods; accessibility, safety, security and comfort of transport, including for people with special needs; human factors such as human/machine interface, human behaviour, user and operator acceptance of new 'intelligent' systems, optimal training methods and use of simulators,

— *Socioeconomic scenarios for the mobility of people and goods*

The aim is to develop strategies and tools for managing the impact of economic and social developments, including deregulation and liberalisation of transport services and globalisation of economic and commercial activities, on mobility demand and transport policies.

RTD priorities: scenarios on travel supply and demand and policy options for mobility demand, market organisation and accessibility; legal, institutional, organisational and financing aspects of transport systems and infrastructures; understanding of the role and constraints of logistics with a view to optimisation; benchmarking tools; methods for enforcement of regulations; methodologies to measure costs and benefits, safety, performance and impacts of different transport systems, networks and their operations; assessment of new technologies and concepts, including their impact on employment, users, the environment, work organisation, social conditions, and safety and security.

(iii) **Land transport and marine technologies**

Objectives and RTD priorities

The aim is to encourage, while preserving the environment and improving safety, the development and integration of knowledge and technologies for products, vehicles and vessels, specific to land transport and sea-based activities taking also into account human and operational factors. The aim is also to meet the technological challenges needed to develop efficient interfaces for logistic infrastructures, including loading units.

Research, technological development and demonstration activities should lead to validated advanced concepts capable of meeting all public and user demands for sustainable mobility and improved safety, while reducing the environmental impact, improving sustainable use of resources and reinforcing Europe's economic strength. The activities under this key action will be closely coordinated with the activities on land and maritime transport under the key actions on sustainable mobility and intermodality, systems and services for the citizen, economic and efficient energy for a competitive

⁽¹⁾ Space-related activities are subject to an overall coordination across the various programmes.

Europe, cleaner energy systems, including renewables, city of tomorrow and cultural heritage and sustainable marine ecosystems,

— *Critical technologies for road and rail vehicles*

The aim is the acquisition of technologies to support the improvement of transport vehicles, equipment and major infrastructure components. Such technologies must be economical, safe, intelligent, clean, efficient, reliable and responsive to new social and economic needs and the expectations of Europeans.

RTD priorities: technologies for advanced powertrain concepts and auxiliary systems, characterised by high efficiency, reliability, reduced emissions, environmental friendliness and cost effectiveness; for noise, vibration and electromagnetic reduction; lightweight components and structures; application of microtechnologies and sensor technologies for advanced components and systems; technologies for improved safety,

— *Innovative road and rail vehicle concepts*

The aim is the development and demonstration of new vehicle concepts using new construction techniques and materials and fulfilling all functional, technological, social and economic constraints. This should contribute to the development of improved transport systems, with increased efficiency and comfort, enhanced safety and environmental friendliness, and improving availability, maintainability, manufacturability and recyclability of vehicles. Priority will be given to concepts for urban and the long-distance transport of passengers and/or goods. The activities will be closely coordinated with the 'City of tomorrow and cultural heritage' key action.

RTD priorities: integration of new systems, structures, and power trains supported by parallel research into specific technologies for vehicle design, engineering and manufacturing operations; integration of on-board systems for intelligent and safe vehicles; integration of technologies, including alternative fuel technologies, for cost-effective vehicle design, manufacturing and use, within a whole life-cycle approach,

— *Human-vehicle interaction*

The aim is to develop cost-effective routes for the upgrading and industrial deployment of on-board components and systems, to be translated into enhanced operability of the various land transport means, proving their flexibility, reconfigurability, robustness, and breadth of applicability. The work will focus on the incorporation of human-vehicle interaction systems within the overall production chain and vehicle concept.

RTD priorities: methodologies supporting the incorporation of human-vehicle interaction elements within the overall vehicle design and prototyping processes; effective architecture for intelligent vehicle monitoring using fault-tolerant, modular, plug-in technologies; ergonomic vehicle design; cognitive engineering technologies for effective driver-vehicle or occupant-vehicle interaction; technologies for improved cabin environment,

— *Advanced technologies for the development of ships and vessels*

The aim is the validation and demonstration of advanced technologies for the development of vessels and offshore structures complying with safety of persons and installations, efficiency and environmental friendliness principles. The acquisition and integration of critical technologies meeting these three objectives will cover all aspects of design, production, operation and decommissioning or dismantling.

RTD priorities: development of critical technologies for vessels, systems and subsystems, covering safety concepts, environmental protection, efficiency, design, production, dismantling and recycling. Research will also cover the development of the new generation of on-board systems, application of new materials, structures and components, and new, optimised and alternative power train concepts,

— *Use of the sea and inland waterways to transport goods and passengers*

The aim is to develop and validate innovative vessel and port infrastructure concepts with maximised performances and interoperability, guided by safety, environmental and economic aspects while fulfilling user requirements. This will include new technological solutions for cargo handling, fast intermodal facilities, for port, inland waterways and marine infrastructures.

RTD priorities: integration of technologies, advanced equipment and systems for innovative vessel concepts and for port infrastructure; integration of technologies for efficient, safe and environmentally friendly transshipment facilities and operations; research to support concurrent development of technical standards, guided by life cycle approaches and performance-based criteria,

— *Technologies for the rational and sustainable management of the sea*

The aim is the development of technologies intended for the study and observation of the seas and the sustainable exploitation of the energy and mineral resources of the sea, including offshore and submarine technologies, unmanned vehicles and submarine acoustics, promoted by a coherent approach to the exploitation of the sea as a source of minerals and energy, improvement of coastal zone management and minimisation of the environmental impact of sea-based activities.

RTD priorities: application of innovative technologies to monitor and forecast the state of the sea, the environment and the sea floor, especially in the deep sea. Development of critical technologies which are safe, efficient and competitive in order to increase the accessibility and exploitation of the marine energy and mineral resources. These activities will be focused on: autonomous and remote-controlled vehicles; safe and efficient submarine technologies for sensing, control, and data transfer; offshore structures and floating production units.

Specific coordination activities with other key actions and with Eureka are planned in order to maximise the effectiveness of Community research.

(iv) **New perspectives for aeronautics**

Objectives and RTD priorities

The overall goal of this key action is to facilitate the development of aircraft and their subsystems and components in order to foster the competitiveness of the European industry, including SMEs, while assuring the sustainable growth of air transportation. In this context, enabling technologies will be developed and integrated for new generation aircraft. The medium-term targets of research, technological development and demonstration activities, involving all research actors including universities and research centres, are to substantially reduce development time and costs of new aircraft, improve efficiency (fuel consumption, maintenance costs, longer life cycles) and reduce environmental impacts (pollutant emissions and perceived external noise) and accident rates (by at least the same factor as the growth of traffic volume).

— *Acquisition of critical technologies*

The aim is to contribute to the long-term competitiveness of the European aeronautics industry, including its supply chain, from a strategic perspective by stimulating the development of enabling technologies. Critical technologies will, in particular, address design and manufacturing of new generation of aircraft, including aircraft concepts more respectful of the environment.

RTD priorities: innovative approaches and evolutionary advances in aerodynamics, structures and application of new materials, propulsion, noise, equipment and systems, advanced sensors and avionics; development of multidisciplinary technologies, such as aeroelasticity, flight mechanics and airframe-propulsion integration; methods and processes for aircraft design and manufacture,

— *Technology integration for new-generation aircraft*

The aim is to facilitate the introduction and combination of the newest technologies and to demonstrate their economic and operational feasibility for new aeronautic products over their long lifetime. This will involve a multidisciplinary approach, including technology platforms and the required validation activities, focusing on lower design, production and operational costs, reduction of consumption, aircraft performance, and environmental aspects.

RTD priorities: advanced design tools and concurrent engineering for reconfigurable, flexible, distributed and multisite production systems; advanced developments in propulsion, structural and aerodynamic efficiency and systems performance and integration; airframe, engine and systems technologies and operational procedures to reduce significantly emissions and engine noise, and improve cabin environment,

— *Operational efficiency and safety*

The aim, with the integration of on-board systems, is to help alleviate congestion in airports, increase air traffic management (ATM) system capacity, and improve the safety performance of aviation, to accommodate the threefold increase in air traffic which is expected over the next 15 years. This work will be closely coordinated with the air-transport-related activities carried out under the key actions 'Sustainable mobility and intermodality' and 'Systems and services for the citizen'. Particular attention will be paid to the development and validation of on-board technologies and their incorporation into vehicles in an operational setting.

RTD priorities: validation and integration of on-board systems for improving the operational capabilities of aircraft and supporting their integration within the future ATM system; maintenance and repair techniques and condition monitoring for improved aircraft reliability and dispatch availability; technologies and methodologies, including the study of human-factor aspects and flight simulation, for more effective accident prevention and improved aircraft design for passenger survivability.

(b) **RESEARCH AND TECHNOLOGICAL DEVELOPMENT ACTIVITIES OF A GENERIC NATURE**

These activities, with potential multisectoral applications, will help the development of European technological capacity and stimulate the flow of ideas, knowledge and applications to complement and support the key actions.

— **New and improved materials and their production and transformation**

Objectives and RTD activities

Efforts will be made to support and network RTD projects leading to the optimisation of collaboration, information exchange, and Community added-value. These networks will form the backbone of the structure of the research activities. They will also play an important role in stimulating international collaboration between Member States and with third countries (e.g. CEECs, United States of America, China) and developing foresight, socioeconomic and strategic studies and impact and risk assessment.

— *Materials with a wide range of applications*

The aim is to promote research on the most promising avenues for improving the functionality and performance of existing materials, and the development of new materials with distinctly new or radically improved characteristics.

RTD priorities: innovative approaches such as nanostructured materials, supramolecular chemistry, colloidal systems and biomimetic materials; catalysts; new and improved structural and light materials, for instance used in extreme conditions, in particular for construction, transport and high-temperature applications; functional materials, in particular opto-electronics and sensor-related materials, whose properties allow reliable operation; new and improved biomaterials such as implants and hybrid tissues; research improving understanding of deterioration and failure mechanisms,

— *Materials production and transformation processes*

Research will focus on technologies which can ensure quality (especially in the context of the trend towards shorter production cycles), reliability and cost-effectiveness of materials, including natural materials, to allow optimum exploitation.

RTD priorities: materials production technologies for high value-added sectors, especially fine chemistry, minerals, metals, polymers, composites, and ceramics; micro- and nanopowder processing technologies; surface, coating and interfacial technologies for advanced materials and functional applications,

— *Sustainable use of materials*

Research will focus on the environmental and safety impact of new materials and the reuse of materials, with the aim of increasing the flow of secondary raw materials with reliable material properties, reducing life-cycle impacts and overcoming barriers with customers.

RTD priorities: research supporting the development of materials which are easy to recycle; recycling processes guaranteeing reliable properties and cost-effectiveness of recycled materials; finding uses for unavoidable waste; research supporting new applications of renewable raw materials, for example for the production of organic chemicals,

— *New and improved materials and production technologies in the steel field*

Objectives and RTD activities

In view of the expiry of the ECSC Treaty in 2002, and the conclusions of the Amsterdam European Council (June 1997), there is an urgent need to speed up the progressive insertion of coal and steel research into the framework programme. The objective is to reduce costs, improve user satisfaction, and increase value-added, to the benefit of both the iron and steel industry and suppliers, end users and other research partners.

Steel research will be focused on the development of flexible, compact and safe production lines, cleaner processes, innovative steel products, and improved recycling.

RTD priorities: coke production for metal-working industries, research to reduce the costs and improve the quality of coke, to improve production of reducing gases, reduce emissions, and improve the safety and health of workers in industrial installations; iron and steel making technologies for flexible and cost-effective production; technologies to reduce energy consumption and CO₂ emission, improve steel cleanliness, and increase recycling rates; casting, rolling and downstream treatment, reduction of weight, and coating and surface techniques; development of improved and high-strength steel grades for higher performance and use in extreme conditions; cost-effective application of by-products,

— *Measurements and testing*

Objectives and RTD activities

Activities will focus on the development of instrumentation, methodologies for measurements and testing and certified reference materials to help achieving the three objectives described below⁽¹⁾:

— *Prenormative research and technical support for standardisation*

Research will focus on the development and validation of measurement and testing methods, and the production of scientific and metrological data needed to define performance and safety criteria for products and services. The goal will be to strengthen Europe's overall competitive position and to promote the implementation of the key actions and of Community policies in collaboration with standardisation bodies and other stakeholders.

⁽¹⁾ Research on certified reference materials will give support to the other specific programmes implementing the fifth framework programme.

RTD priorities: development of new standards and improvement of existing standards over the range of industrial requirements; support for the development of performance standards and directives to facilitate trade, to protect consumers and the work environment and to favour mutual recognition agreements,

— *The fight against fraud*

Research will focus on developing measurement and testing systems to detect and prevent fraud, in order to better protect the economic interests of enterprises and society and the health of consumers. The long-term aim will be to keep know-how and technology ahead of the defrauder.

RTD priorities: to combat counterfeited or falsely labelled industrial and agricultural products; avoidance of circumvention of trade regulations and Community legislation, including customs tariffs, quotas, and waste disposal; new methods for the detection of drugs and doping, detecting false banknotes and value certificates; identification of the provenance of cultural artefacts,

— *Improvement of quality*

Research will support the development of generic measurement and testing methods, instruments and measuring systems, including software, and this will also strengthen the SME-intensive instrumentation sector. Research will focus further on the development of quality assessment systems for private and public enterprises and on identifying measurable attributes that users perceive to be present in quality products and services. Research needed to remove technical barriers to trade within Europe and with third countries will also be included. The activities are to be developed in conjunction with the relevant activities in the other programmes.

RTD priorities: calibration and transfer standards, feasibility studies for certified reference materials and banks of reference substances to assure reliability and traceability of measurements; instruments for high-performance measurements; robust and portable instruments for *in situ* and reference measurements, models and software tools for the validation of measurement methods; tools to support mutual recognition agreements, for improving quality within organisations and enterprises, including SMEs, and for measuring user satisfaction; methodologies to support certification and accreditation in metrologically less developed fields.

(c) SUPPORT FOR RESEARCH INFRASTRUCTURES

Industrial research in Europe is widely recognised for its excellence, with well-established strongholds at national level. To bring competitive advantages, scientific and technological RTD results must, however, be converted into successful applications. Apart from the development of exploitation-oriented projects, there is a real need to share facilities effectively and to exchange data and experience more efficiently, for example for testing new machines, vehicles, or processes. In addition, research constantly generates new data and in increasing quantities. Collecting and organising such data at European level will benefit industry and the whole user community. Not only will research efficiency be improved by reducing duplication but, more importantly, focusing the whole fabric of research infrastructure in Europe on common goals will enable a strategic approach to be put in place.

Objective and activities

Action is needed to encourage the optimum utilisation of existing research infrastructures and large installations of high scientific and technological standard and in very close relation to the key actions. Pooling of resources and transnational access for example for research manufacturing centres, transport test facilities, high-power wind tunnels, industrial design computing centres, or materials and structures test facilities, are needed to better exploit new techniques based on fixed major equipment and associated instrumentation. The existing facilities must be encouraged to cooperate for the mutual benefit of their operators and the European RTD and user communities in order to avoid duplication

of work, increase complementarity and ensure interoperability of data exchanges. As the stages of development of the various national institutions vary across the Community, there is also a need to reinforce collaboration, in areas such as conformity assessments, training activities and transfer of know-how. In summary, support is aimed at improving the information about the existing possibilities and improving transnational access to research infrastructures for the benefit of:

- (i) the optimum utilisation of geographically dispersed medium- and large-scale research facilities,
- (ii) the rapid transfer of existing and complementary RTD results to industrial applications,
- (iii) and the improvement and interoperability of common protocols and data exchanges.

— The support activities for research infrastructures are aimed at improving the information flow towards European researchers and at facilitating transnational access to facilities to which researchers would not normally have access. This will also encourage and facilitate transnational cooperation in the rational and cost-effective development of research infrastructures in response to emergency needs.

Support activities will stimulate access to facilities related to the various key actions, in particular to computing centres and large scale experimental facilities for industrial research, transport test facilities and high-power wind tunnels,

— The setting up of virtual institutes will promote the coordination and the pooling of resources between research centres, organisations and users (including SMEs) to achieve synergy and reap wider benefits around the objectives of the key actions and generic technologies. This activity will facilitate the creation of virtual facilities generating sufficient critical mass for research into higher performance techniques, instrumentation and technologies. Community support will be limited in time.

Support activities would be meant as an incentive to speed up cooperation and the use of information and communications technologies for geographically dispersed facilities leading to improved transfer and exploitation of results, in particular for SMEs, in the field of materials, production technologies, and measurement and testing,

— Support for European metrological infrastructure will reinforce cohesion between Member States and third countries. This will benefit mutual recognition and conformity agreements. Particular attention will be paid to the impact of these agreements on SMEs.

Community funding will be directed towards intercomparisons and inter-laboratory performance analyses, support for interoperable database structures, the production of certified reference materials; support for the improved use by SMEs and for the implementation of the abovementioned agreements and quality standards,

— Reference databases have been identified as one of the means of strengthening the European research fabric. Efforts will focus on ensuring that the data generated are of acceptable quality and comparability and on bringing together sectorial and local activities in support of European research. Such activities will preserve the property rights of individual organisations.

Support activities, in particular for materials and aeronautics research, will help to catalogue and compare RTD actions at national and international level and the output of different research facilities.

ANNEX III

SPECIFIC RULES FOR IMPLEMENTING THE PROGRAMME

The specific programme will be implemented through the indirect RTD actions provided for in Annexes II and IV to the fifth framework programme. In addition, the following rules specific to this programme will apply:

1. Accompanying measures

The accompanying measures will comprise in particular:

- studies in support of the specific programme, including the preparation of future activities,
- take-up measures, including trials, best practice actions, first user actions, assessment and qualification actions and other actions aimed at stimulating broad take-up, particularly in SMEs, and encouraging innovation,
- the exchange of information, conferences, seminars, workshops or other scientific and technical meetings, including for international cooperation schemes,
- recourse to external expertise, including access to scientific databases, in particular for the purposes of the monitoring of the specific programme provided for in Article 5(1) of the fifth framework programme, the external assessment provided for in Article 5(2) of the fifth framework programme and the evaluation of indirect RTD actions and the monitoring of their implementation,
- dissemination, information and communication activities, including scientific publications, activities for the exploitation of results and the transfer of technologies; encouragement of innovation financing and assistance with the protection of intellectual property,
- training schemes related to RTD activities covered by the specific programme other than Marie Curie fellowships,
- support for schemes to provide information and assistance for research players, including SMEs,
- recourse to external expertise in setting up and providing access to information, assistance and research and innovation promoting services and networks.

2. Coordination arrangements

The Commission will endeavour to ensure complementarity between the indirect RTD actions under the programme, in particular by grouping them around a common objective, and to avoid duplication, while respecting the legitimate interests of proposers of indirect RTD actions.

As far as possible, coordination will also be ensured between actions under the specific programme and those carried out in:

- other specific programmes implementing the fifth framework programme,
- the research and training programmes implementing Council Decision 1999/64/Euratom of 22 December 1998 concerning the fifth framework programme of the European Atomic Energy Community (Euratom) for research and training activities (1998 to 2002)⁽¹⁾,
- other European research frameworks including Eureka and COST,
- other Community research-related instruments.

⁽¹⁾ OJ L 26, 1.2.1999, p. 34.

It will comprise:

- (i) the identification of common themes or priorities, resulting in particular in:
 - the exchange of information,
 - the carrying out of work decided on jointly, entailing in particular the joint initiation of one of the procedures referred to in Article 9 of the rules for participation and dissemination,
 - (ii) the reassignment of proposals for indirect RTD actions between specific programmes or between a specific programme and a research and training programme.
-

COUNCIL DECISION

of 25 January 1999

adopting a specific programme for research, technological development and demonstration
on energy, environment and sustainable development (1998 to 2002)

(1999/170/EC)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 130i(4) thereof,

Having regard to the proposal from the Commission⁽¹⁾,

Having regard to the opinion of the European Parliament⁽²⁾,

Having regard to the opinion of the Economic and Social Committee⁽³⁾,

(1) Whereas by Decision No 182/1999/EC⁽⁴⁾, the European Parliament and the Council adopted the fifth framework programme of the European Community (hereinafter referred to as the fifth framework programme) for research, technological development and demonstration (hereinafter referred to as RTD) activities for the period 1998 to 20002 setting out the general outlines and scientific and technological objectives of the activities to be carried out in the fields of energy, environment and sustainable development;

(2) Whereas Article 130i(3) of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity under the framework programme, and that each specific programme shall define the detailed rules for implementing it, fix its duration and provide for the means deemed necessary;

(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⁾ and Article 4(2) of the Council Decisions on the specific programmes implementing the fourth framework programme, the Commission has arranged for an external assessment to be conducted which it has transmitted to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions together with its conclusions and comments;

(4) Whereas, in accordance with Article 130j of the Treaty, Council Decision 1999/65/EC of 22 December 1998 concerning the rules for the participation of undertakings, research centres and universities and for the dissemination of research results for the implementation of the fifth framework programme of the European Community (1998 to 2002)⁽⁶⁾ (hereinafter referred to as 'the rules for participation and dissemination') applies to this specific programme; whereas these rules allow the participation of the Joint Research Centre in the indirect actions covered by this specific programme;

(5) Whereas, for the purpose of implementing this programme, in addition to cooperation covered by the Agreement on the European Economic Area or by an Association Agreement, it may be appropriate to engage in international cooperation activities, in particular on the basis of Article 130m of the Treaty, with third countries or international organisations;

(6) Whereas implementation of this programme will also comprise activities and mechanisms aimed at stimulating, disseminating and exploiting RTD results, in particular *vis-à-vis* small and medium-sized enterprises (SMEs), and activities to stimulate the mobility and training of researchers;

⁽¹⁾ OJ C 260, 18.8.1998, p. 48.

⁽²⁾ Opinion delivered on 15 December 1998 (not yet published in the Official Journal).

⁽³⁾ OJ C 407, 28.12.1998, p. 123.

⁽⁴⁾ OJ L 26, 1.2.1999, p. 1.

⁽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).

⁽⁶⁾ OJ L 26, 1.2.1999, p. 46.

- (7) Whereas it is important that the scientific, industrial and user communities should contribute substantially to the definition of activities to be undertaken and should be involved, as appropriate, in the implementation of this programme;
- (8) Whereas research activities under the fifth framework programme should also be geared towards innovation in order to contribute, *inter alia*, to the objectives of the first action plan for innovation;
- (9) Whereas special emphasis should be placed on encouraging the participation of SMEs;
- (10) Whereas the equal opportunities policy of the Community must be taken into account in the implementation of this programme;
- (11) Whereas efficient and transparent management contributes to a more effective and user-friendly programme;
- (12) Whereas administrative expenditure should be included in the Community budget in a transparent fashion;
- (13) Whereas the implementation of this programme should be monitored with a view to adapting it, where appropriate, to scientific and technological developments; whereas in due course there should also be an assessment of progress with the programme by independent experts;
- (14) Whereas the Scientific and Technical Research Committee has been consulted on the scientific and technological content of the specific programmes,

HAS ADOPTED THIS DECISION:

Article 1

In accordance with Article 3(1) of the fifth framework programme, the specific programme on energy, environment and sustainable development (hereinafter referred to as the specific programme) is adopted for the period from 25 January 1999 to 31 December 2002.

Article 2

1. In accordance with Annex III to the fifth framework programme, the amount deemed necessary for carrying out the specific programme is EUR 2 125 million, including a maximum of 6,5 % for the Commission's administrative expenditure.

An indicative breakdown of this amount is given in Annex I.

2. Of the amount in paragraph 1

— EUR 446 million is for the period 1998 to 1999,

and

— EUR 1 679 million is for the period 2000 to 2002.

In the case referred to in Article 2(1)(c) of the fifth framework programme, the Council shall adapt the latter figure in accordance with Article 2(1)(c), second indent of the fifth framework programme. Pending a decision by the Council, this specific programme shall not be implemented beyond the provision of the first indent.

3. The budgetary authority shall, in compliance with the scientific and technological objectives and priorities laid down in this Decision, set the appropriations for each financial year taking into account the availability of resources within the multiannual financial perspective.

Article 3

1. The general outlines, the scientific and technological objectives and the priorities for the specific programme are set out in Annex II. They are consistent with the principles and the three categories of selection criteria indicated in Annex I to the fifth framework programme.

2. In accordance with these principles and criteria the selection criteria indicated in Article 10 of the rules for participation and dissemination shall be applied for the selection of the RTD activities to be carried out.

In addition, any participation of industrial entities in industrially-orientated shared-cost actions should, as a general rule, be appropriate to the nature and purpose of the activity.

All these criteria shall be complied with in the implementation of the programme, including the work programme referred to in Article 5(1), although they may be weighted differently.

3. The rules for participation and dissemination shall apply to the specific programme.

4. The detailed rules for financial participation by the Community in the specific programme are those referred to in Article 4 of the fifth framework programme.

The indirect RTD actions under the specific programme are defined in Annexes II and IV to the fifth framework programme.

Specific rules for implementing the programme are set out in Annex III to this Decision.

Article 4

In the light of the criteria referred to in Article 3, and the scientific and technological objectives and priorities set out in Annex II, the Commission:

- (a) shall monitor, with appropriate assistance from independent external experts, the implementation of the specific programme and, where appropriate, submit proposals to Council for adapting it, in accordance with Article 5(1) of the fifth framework programme;
- (b) shall arrange for the external assessment provided for in Article 5(2) of the fifth framework programme to be conducted concerning the activities carried out in the fields covered by the specific programme.

Article 5

1. The Commission shall draw up a work programme specifying:

- (a) in greater detail, the objectives and RTD priorities of Annex II;
- (b) the indicative timetable for the implementation of the specific programme;
- (c) the coordination arrangements set out in Annex III and arrangements to secure the objectives, related to innovation and the participation of SMEs, of the third activity of the fifth framework programme;

(d) where necessary, the selection criteria and the arrangements for applying them for each type of indirect RTD action.

2. The work programme shall take account of relevant interests, in particular the scientific, industrial and user communities. It shall serve as a basis for implementing the indirect RTD actions according to the procedures set out in the rules for participation and dissemination.

3. The work programme shall be updated where appropriate and be made available by the Commission to all interested parties in a user-friendly form, including in electronic form.

Article 6

1. The Commission shall be responsible for the implementation of this specific programme.

2. The procedure laid down in Article 7 shall apply for the adoption of the following measures:

- the drawing-up and updating of the work programme referred to in Article 5(1), including regarding the content of calls for proposals,
- approval of RTD actions proposed for funding, including participation by entities from third countries, where the estimated amount of the Community contribution under this programme is equal to or more than EUR 0,6 million,
- the drawing-up of the terms of reference for the external assessment provided for in Article 5(2) of the fifth framework programme,
- any adjustment to the indicative breakdown of the amount as set out in Annex I.

Article 7

1. The Commission shall be assisted by two programme committees (hereinafter referred to as 'the committees'), one committees for the subprogramme 'Environment and sustainable development' and one for the subprogramme 'Energy', each composed of representatives of the Member States and chaired by a representative of the Commission.

2. In the cases referred to in Article 6(2), the representative of the Commission shall submit to

the committee a draft of measures to be taken. The committee shall deliver its opinion on the draft measures referred to above within a time limit which the Chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148(2) of the Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The Chairman shall not vote.

3(a) The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee.

(b) If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority.

If, on expiry of a period of nine weeks from the referral of the matter to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

4. The Commission shall regularly inform the committees of the overall progress of the

implementation of the specific programme, and shall in particular provide them with information about the progress of all RTD actions funded under this programme.

Article 8

In accordance with Article 5(4) of the fifth framework programme, the Commission shall regularly inform the Council and the European Parliament of the overall progress of the implementation of the programme, including on the participation of SMEs and the simplification of administrative procedures.

Article 9

This Decision is addressed to the Member States.

Done at Brussels, 25 January 1999.

For the Council

The President

J. FISCHER

ANNEX I

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

<i>(million EUR)</i>	
Type of activity	Amount
<i>A. Environment and sustainable development</i>	
(a) Key actions	
(i) Sustainable management and quality of water	254
(ii) Global change, climate and biodiversity	301
(iii) Sustainable marine ecosystems	170
(iv) The city of tomorrow and cultural heritage	170
(b) Research and technological development activities of a generic nature	119
(c) Support for research infrastructures	69
Subtotal	1 083
<i>B. Energy</i>	
(a) Key actions	
(i) Cleaner energy systems, including renewables	479
(ii) Economic and efficient energy for a competitive Europe	547
(b) Research and technological development activities of a generic nature	16
Subtotal	1 042
Total	2 125

ANNEX II

THE GENERAL OUTLINES, THE SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES AND THE PRIORITIES

INTRODUCTION

Research, technological development and demonstration (RTD) in the fields of environment, energy and sustainable development is essential for the social well-being of Europe's citizens and the implementation of Union policies. Making use of the knowledge and technologies developed by this programme will make it possible to meet a wide range of social and economic needs so reconciling economic development with environmental sustainability. New markets will bring growth and employment; reliable and competitive supply of energy will be ensured and energy requirements will be met. The results will provide the basis for policies formulated at Community level or deriving from international environmental commitments — in particular, the implementation of the Kyoto Protocol requires urgent support for RTD on a number of issues.

This programme will encourage integrated multidisciplinary approaches seeking to solve problems with a European dimension for which scientific and technological developments are needed. People are a key interactive component of the ecosystem and, therefore, a fair balance between scientific and socioeconomic disciplines must be found in project implementation.

Harnessing the full spectrum of these RTD activities, ranging from basic research to demonstration projects, and using all suitable instruments, including supporting proposals spanning the spectrum of RTD activities, are envisaged to tackle the major issues at stake, in order to meet the need for a better understanding of natural processes and patterns and the interactions with human activities through to the development of new technologies and instruments ensuring further steps towards sustainable development.

Although research and technological development in the field of environment and energy are closely related, they remain distinct areas. For this reason, they will be implemented through two subprogrammes, 'Environment and sustainable development' and 'Energy', each with its own budget and programme committee. Exchange of information between the two committees will be ensured as appropriate.

Strategic objective of the programme

The strategic goal is to contribute to sustainable development by focusing on key activities crucial for social well-being and economic competitiveness in Europe.

An *innovative approach* based on two main elements will make it possible to address complex social-driven issues: integrated multidisciplinary and multisectoral activities involving wherever possible the principal stakeholders, private-public sector partnerships, and end-users from the business, industrial and policy-making sectors, and concentrating on finding solutions to strategic problems, and supporting only proposals which are of substantive regional, European and global significance. Europe has established a leading RTD role in many areas — this must be sustained and remain at the cutting-edge. In other areas improvements are needed for the future benefit of society, as well as the business and industrial sectors.

Social objectives Society is making increasing demands for better living conditions, better safety, and better use of scarce resources including secure and economic energy supplies and services. Availability

of a sufficient and economic energy supply must be assured to promote industrial competitiveness and to maintain the quality of life for Europe's citizens. At the same time, the environmental impact of energy production and use must be reduced. Water is of economic, environmental and social strategic value. Rising population and per-capita use of resources, globalisation of economic markets and natural variability in earth systems are causing or exacerbating major environmental problems. The sea is essential for trade and transport in Europe, a source of numerous resources and a major resource for tourism, but it is also the ultimate repository for many by-products of human activity. Cities together with their cultural heritage are the centre of social, cultural and economic life for 80 % of Europe's citizens. These key societal issues will only be solved if in addition to developing technologies the socioeconomic context is appropriately analysed and taken into account.

European added-value and subsidiarity. Environmental problems, energy systems, networks and services and the associated environmental impacts, as well as sustainable development issues must be approached in the global context. In this respect, the European level is the most appropriate: most problems and challenges are common to all Member States and most activities to be addressed in the programme are not only European, but also global, in scale. By mobilising resources and focusing on key targets, the programme will form a key part of the European contribution to global initiatives and programmes. Knowledge generated through collaborative RTD at the European level, together with the coordination of fragmented European knowledge, is essential to address the very serious problems facing the Union. These efforts, including prenormative research, will confer genuine European added-value to the efforts to develop appropriate regulatory frameworks, for example in the post-Kyoto process.

Economic development and scientific and technological prospects. The promotion of sustainable development will not be possible unless economic objectives relating to technological development, competitiveness and growth are reconciled with societal goals such as quality of life, employment, security, health and a high quality environment. This challenge must be met in the context of significant structural and demographic changes, and globalisation of the economy. Improving our quality of life and decoupling economic growth from environmental degradation will contribute to European competitiveness and employment. Secure and economic energy supplies and services are vital for all aspects of economic activity. The need for energy equipment suppliers and operators to be competitive in the global market is vital for employment. Enormous potential will exist for global exploitation from several areas of the programme, strengthening economic competitiveness and creating new jobs, such as in the water industry, renewable energy technologies, rational use of energy and reuse of resources, as well as technologies to improve energy efficiency and the water and/or energy industries.

LINKS AND COMPLEMENTARITY WITH THE OTHER PROGRAMMES

Collaboration, coordination and complementarity will be fostered within and between key actions in this and other programmes, including the activities of the JRC. This is of particular significance here given the Community's commitments on integrating environment protection requirements into other policy areas. Coordination with other thematic programmes will be based on the following principles: activities in the quality of life and management of living resources programme will concentrate on epidemiology research arising from environmental and climate changes, whereas this programme will focus on the consequences for human health from climate change; activities within the information society programme will concentrate on the development of information society technologies, and activities in this programme on the integration and adaptation of these technologies in applications; and activities in the programme for promoting competitive and sustainable growth will concentrate on the design and development of materials and technologies for generic use and treatment of industrial waste within the production centre but in this programme the activities will concentrate on the integration, application and demonstration of technologies and materials for energy or urban use, including their design and development where specifically needed for urban or cultural heritage use and the management of industrial waste outside the production centre.

Major examples of collaboration with key actions in other programmes where action to avoid duplication is essential will be found with health, food and environmental factors (climate change and air pollution), sustainable agriculture and fisheries (marine ecosystems), systems and services for the citizen (earth observation technologies and energy distribution networks), land transport and marine

technologies (marine ecosystems, transport and offshore hydrocarbon exploitation), sustainable mobility and intermodality (urban environment) and innovative products, processes and organisation of production (urban waste, materials and industrial processes). Complementarity and coordination will also be assured with the horizontal activities of the framework programme.

- Global international cooperation with international organisations and the scientific, business and industrial communities from third countries is inescapable to address many cross-border environmental issues central to implementing international conventions and programmes, as well as the environmental consequences of energy policies and cross-border supply interdependency. Close links will be maintained with the pre-accession States to collaborate on tackling some of the research needed to meet common challenges and common objectives corresponding to the programme priorities and as such will be open to third country and international organisations. The focus will continue to be fields of mutual concern and cooperation, particularly on global change and related issues through the development and implementation of mechanisms such as the European network for research on global change. There will also be coordination with the programme 'Confirming the international role of Community research' which will address activities of specific regional relevance to the third countries concerned. Legal entities from third countries and international organisations may participate in this programme according to the priorities set out herewith, in line with the objectives outlined in the programme 'Confirming the international role of Community research' and with the rules for participation and dissemination. Full use will be made of the possibilities offered by COST and Eureka and by cooperation with international organisations to foster synergy between actions and projects in this programme and nationally funded research activities. In the case of cooperation with Eureka, projects corresponding to themes of common interest with the framework programme may be developed in the context of the key actions, in conformity with the selection criteria and procedures of the framework programme,
- Activities related to innovation and participation of small and medium-sized enterprises (SMEs) will be given a particular emphasis to help bridge the gap between research results and their effective exploitation in potential applications by the business and policy-making sectors. The participation of SMEs in all RTD activities will be stimulated and encouraged. Their important potential to contribute to the innovation process is fully recognised. Exploratory awards will be available to facilitate the participation of SMEs in collaborative RTD, as well as in cooperative RTD in the case of SMEs without relevant research facilities of their own. An 'innovation unit' will target promotion activities on the deployment and use of the results of this programme; it will also help to ensure complementarity and an interface with the innovation activities implemented in the context of the programme on innovation and participation of SMEs,
- Improving the know-how, skills and qualifications of European researchers and the understanding of the socioeconomic impact of research in the fields covered by this programme is essential to ensure sufficient availability of appropriate expertise and to establish tangible and lasting impacts. Training and socioeconomic research will therefore form an integral part of this programme, complemented by appropriate links with the horizontal programme 'Improving the human research potential and the socioeconomic knowledge base'. Training activities in this programme will include support to fellowships, which will take the form of Marie Curie fellowships following the definitions and rules set out in the horizontal programme, and advanced study and specialised courses.

A. ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

The strategic goal of this part of the programme is to promote environmental science and technology so as to improve our quality of life and boost growth, competitiveness and employment, while meeting the need for sustainable management of resources and protection of the environment in line with the goals and objectives of the fifth action programme on the environment as well as other Community policies relating to the environment.

The RTD and demonstration projects will concentrate through four key actions on tackling the issues of sustainable water management and water quality; global change, climate and biodiversity;

sustainable integrated management of marine resources; and city of tomorrow and cultural heritage as well as generic activities concerning the fight against major hazards, the development of earth observation technologies, and socioeconomic aspects of environment within the perspective of sustainable development (the impact on society, the economy and employment). Specific attention will also be given to the need for an optimum use of existing European research infrastructures and for transnational cooperation in the rational and cost-effective development of European research infrastructures to support cutting-edge research in environmental activities.

(a) KEY ACTIONS

(i) Sustainable management and quality of water

Objectives and RTD priorities

The overall goal of this key action is to produce the knowledge and technologies needed for the rational management of water resources, for tackling important problems such as water scarcity, and for networks for domestic needs and those of industry and agriculture, while maintaining the integrity of ecosystems. Research will focus on:

- *Development of treatment and purification technologies to prevent pollution, to purify water, to prevent and mitigate salination of water resources and to use and/or reuse water rationally as well as the development of an integrated approach for the management of water resources and wetlands*

The aim is to develop the knowledge and the technologies needed for the rational management of water resources; to match water supply with demand and achieve cost-efficiency and sustainability; to improve the science base (including on habits, attitudes and cultural patterns), methodologies and management tools to provide a better understanding of the phenomena and allow integrated management and sustainable use of water and wetlands at catchment scale, within constraints of availability, environmental quality and socioeconomic cost-benefits; to develop technologies to prevent and treat pollution of water bodies and groundwater stocks, to purify water and to use and/or reuse water rationally (including closed loop approaches and reliability of collection and distribution networks).

RTD priorities: tools and methodologies for cost-effective and sustainable integrated water resources and wetlands management; effective transfer of knowledge and skills to water users; development of real scale applications across Europe with a view to supporting EU policy; optimisation of technologies to treat and purify drinking water and to minimise use and pollution of water; process-integrated treatment of waste water at source; rational reuse of water; application of closed loop technologies; development of integrated procedures to assess the state of water systems; development of advanced processes to prevent and alleviate salination,

- *Technologies for monitoring and prevention of pollution, protection and management of groundwater and surface water resources, including ecological quality aspects*

The aim is to characterise and to assess the state and evolution of the quality and quantity of surface and groundwaters as well as the functioning of aquatic and wetland ecosystems as the basis for more rational management. This will include the development of technologies for assessing and treating pollution originating from contaminated sites and waste disposal sites as well as the development of biological assessment methods for monitoring water quality.

RTD priorities: improved methods of measuring and monitoring water quality and quantity and techniques for analysing pollutant flows and development of technologies for integrated assessment of soil pollution treatment methods; nutrients from diffuse sources; predictive models and advanced pollution impact assessment methodologies; updated water quality criteria and indicators for water policies,

— *Surveillance, early warning and communication systems*

The aim is to develop systems able to react on different time and space scales, including early-warning predictive systems with direct feedback to pollution sources.

RTD priorities: surveillance systems for point and diffuse pollution sources and for the various environmental recipient systems; control and data management systems, including leakage detection and stormwater management and systems for floods and drought assessment,

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

The aim is to improve and protect water resources and aquatic ecosystems, to optimise water management systems in arid regions, and to better manage water crises.

RTD priorities: integrated approaches at catchment and collection point level incorporating the various political, social, economic and environmental interactions; improved systems for management of water resources and their use at EU, national, regional and local level to assist decision making.

(ii) **Global change, climate and biodiversity**

Objectives and RTD priorities

The aim of this key action is to develop the scientific, technological and socioeconomic basis and tools necessary for the study and understanding of changes in the environment. Aiming for an integrated approach, the priorities are:

— *To understand, detect, assess and predict global change processes*

The aim is to focus mainly on European and subregional causes and impacts of specific global change problems, such as climate change, ozone depletion, biodiversity loss, loss of fertile land and habitats, disruptions to ocean circulation. Attention will be given to both natural and anthropogenic phenomena, in the context of the sustainable use of natural resources.

RTD priorities: variability and change in and between: atmospheric composition, ozone depletion and UVB radiation; biogeochemical and hydrological cycles, biodiversity, climate, ocean processes, sea level; link between climate change and the frequency and scale of extreme events; socioeconomic interactions and impacts on natural resources and human health,

— *To foster better understanding of the terrestrial and marine ecosystems and the interaction between them and other ecosystems*

The emphasis will be on ecosystem interactions with land surfaces and land use, soil, water, atmosphere and ocean; role of biodiversity and climate change; interactions between ecosystems, biogeochemical cycles, large-scale land degradation and desertification.

RTD priorities: global change scenarios and their impact on terrestrial, freshwater and marine ecosystems and the consequences thereof for food security and resource utilisation; assessment of biodiversity, including losses; assessment of global change and climate change impacts on, and risks to, key sensitive systems or areas; identification and quantification of ecosystem role in biogeochemical cycles; land use modelling, soil degradation and desertification trends,

- *To develop scenarios and strategies for the prevention and mitigation of, and for possible adaptation to, the effects of global change, climate change and for the conservation of biodiversity in the context of sustainable development*

The aim is to provide a sound scientific basis for the development of tangible management strategies and actions to address the adverse consequences outlined in the key action.

RTD priorities: formulation and evaluation of options, assessing their scientific, economic, technical and policy feasibility, and their social acceptability; conditions for decoupling economic growth and environmental deterioration; assessment and enhancement of institutional capabilities for implementation of international treaties,

- *To support the development of the European component of the global observation systems for climate, terrestrial systems and oceans*

The aim is to identify and help fill key gaps in existing observation system capacity in order to ensure that the necessary data are available to address the prediction, impact assessment and response options to global change.

RTD priorities: development of instruments, systems and methods to establish and process long-term consolidated data sets of key variables by both *in-situ* measurements and remote sensing techniques. This will cover, as required, the atmosphere, oceans (using, *inter alia*, Euro-GOOS), land, hydrosphere, cryosphere and biosphere.

(iii) Sustainable marine ecosystems

Objectives and RTD priorities

The aim of this key action is to promote the development of sustainable integrated management of marine resources and to contribute to the marine aspects of environment and sustainable development policies of the EU.

This action will contribute to better coordination of national marine policies, and therefore a continued commitment is required, all the more so because the European seas are among the most heavily used in the world. Synergy with other relevant activities of the framework programme will be ensured through a specific coordinating mechanism. The research objectives are:

- *To develop the scientific knowledge on marine processes, ecosystems and interactions*

The aim is to facilitate the sustainable use of the marine environment and resources while fully respecting its overall integrity and functioning.

RTD priorities: effects of physical forces, environmental factors and interactions at the ocean boundaries on ecosystem functioning and natural variability; extreme environments and their communities: functioning and potential for exploitation; sedimentary systems and their contribution to the sustainable management and use of shelf, slope and deepsea floor; origin, delivery and cycling of contaminants, key elements and nutrients, and their impact on ecosystem functioning,

- *To reduce the anthropogenic impact on biodiversity and the sustainable functioning of marine ecosystems through analysis of its causes, consequences and possible solutions and through development of safe, economic and sustainable exploitation technologies*

The aim is to reduce the impact of human activity on the biodiversity and sustainable functioning of marine ecosystems and to develop the technologies required to facilitate safe and profitable economic yet sustainable exploitation of marine resources.

RTD priorities: effects of anthropogenic activities, including exploitation, tourism and urbanisation along the coast, and those of species introduction and biogeochemical cycling on ecosystems; mechanisms of marine biodiversity evolution to reverse trends in its reduction; processes that mitigate impact of contaminants and eutrophication, recovery of degraded systems. Development of technologies for (i) the characterisation and monitoring of marine environments; (ii) sample collection; (iii) exploration of living resources for biotechnological applications; (iv) communication, surveying analysis, imaging, modelling and monitoring systems, deepsea instrumentation and exploratory platforms,

— *To develop the capacity for monitoring and managing coastal phenomena*

The aim is to alleviate pollution, flooding and erosion, in particular of fragile coastlines, and to facilitate land reclamation from the sea.

RTD priorities: long-term coastal morphological changes, interactions between ecology (including vegetation and fauna), morphology, erosion and impact of human activities; extreme events, risk analysis, sea state propagation from offshore to the coast; tidal inlets and river mouths dynamics and stability; estuarine morphodynamics and estuarine-coastal interaction; fate of pollutants; natural coastal defence mechanisms, impact assessment of structures on marine environment, adaptation of innovative engineering techniques for minimising disturbances of the ecosystems; instrumentation, data management and modelling for effective monitoring,

— *To enable operational forecasting of environmental constraints on offshore activities*

The aim is to facilitate safe, sustainable offshore operations within the given environmental constraints and to develop the necessary components of an appropriate marine observation system.

RTD priorities: development of pilot systems for monitoring, prediction and management, with a view to safe offshore operations: (i) observation and measurement techniques and tools for systematic acquisition of ocean parameters, (ii) improve forecasting techniques through refinement of mathematical models capable of predicting impact of natural and human-induced variations on marine ecosystems and resources, (iii) methodologies to assess the pertinence of environmental parameters, and (iv) best practice compatible with requirements of international regulations and conventions.

(iv) **The city of tomorrow and cultural heritage**

Objectives and RTD priorities

The overall goal of this key action is to support sustainable economic development and competitiveness, improved urban management and integrated planning policy, and help safeguard and improve the quality of life and cultural identity of citizens. It will focus on the provision of an integrated socioeconomic knowledge-base, and products, services, tools and technologies for better city management and on the environmental challenges, particularly in relation to reducing pollutant emissions.

— *Integrated approaches aiming at sustainable development of cities and rational management of resources*

The aim is to create new models for the sustainable development of European cities and city regions and prepare medium- and long-term socioeconomic scenarios and research, development and demonstration activities focusing, in particular, on supporting and stimulating economic competitiveness, town planning and architecture, social integration, safety, energy efficiency and conservation (in particular in buildings and in urban transport) and the exploitation of information networks (the concept of 'digital cities').

RTD priorities: urban development scenarios and integrated planning tools; developing strategies for job creation and socioeconomic integration, also taking into account safety and multicultural

aspects; impact of technologies, infrastructure, noise and air pollution from all sources on social development, changes in urban surface use, resource utilisation, health and the environment; demand management, safety and security of supply of essential resources (e.g. energy, land and water); integrated approaches to better use and conservation of resources and reduced pollution and waste taking into account social and environmental sustainability,

— *Protection, conservation and enhancement of European cultural heritage*

The aim is to develop sound management of cultural resources of cities and urban regions to improve citizens' quality of life, tourism and job creation.

RTD priorities: products, methodologies and technologies for diagnosis, protection, conservation, restoration and the sustainable use of the European cultural heritage, focusing on promotion of both movable and immovable cultural assets and the quality of life; measures for protecting cultural heritage against technological and natural hazards; methodologies, including risk assessment, for harmonious and effective integration of cultural heritage into the urban setting,

— *Development and demonstration of technologies for safe, economic, clean, effective and sustainable preservation, recovery, renovation, construction, dismantling and demolition of the built environment, in particular for large groups of buildings*

The aim is to conserve, renovate, enhance, protect and develop the built environment in a manner which responds to citizens' and cultural needs, in a framework of long-term sustainability and improved quality of life.

RTD priorities: effective technologies for economic, safe and environment-friendly design, maintenance, repair, modernisation, conversion, construction, dismantling and demolition of the built environment, in particular for large groups of buildings; essential services to combat hazards and deterioration; more efficient management of resources (materials, energy, water, etc.); safety, security and social dimensions; optimum use and reuse of land (above and beneath the ground), including rehabilitation of contaminated sites; reliable environmental impact assessment; indoor environmental management,

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

The aim is to promote sustainable cost-effective and user-oriented transport strategies and solutions, integrated within the overall urban context, in order to reduce radically pollution levels (noise and emissions) and urban congestion at affordable prices for users, while guaranteeing effective operation, the quality of life, including socioeconomic aspects, and conservation of the cultural heritage.

RTD priorities: comparative assessment and demonstration of strategic approaches and of technical solutions for innovative and sustainable, collective and individual, transport systems and methodologies and related infrastructure in a specific urban context.

(b) RESEARCH AND TECHNOLOGICAL DEVELOPMENT ACTIVITIES OF A GENERIC NATURE

— The fight against major natural and technological hazards

Objectives and RTD activities

The aim is, through a better understanding of processes, mechanisms and events generating natural and technological hazards, to develop technologies and methods for environmental impact assessment, risk forecasting, prevention, evaluation and mitigation. Support to improved decision-making systems, including evaluation and validation tools for assessing hazards and for emergency management would be provided.

RTD priorities: identification and analysis of factors which increase the level of natural risks; development and improvement of methods, models and tools for hazard vulnerability and risk assessment including quantification of the present and future levels of risk; development of effective tools and methods for information management; development of innovative methods and technologies to combat disasters and alleviate their consequences; improvement of the operational safety of hazardous installations,

— **Development of earth observation satellite technologies⁽¹⁾**

Objectives and RTD activities

The strategic aim is to provide a sustainable European capability in operational services for monitoring the earth from space, leading to improvements in our understanding of the planet, more effective conservation of our natural heritage, enhanced management of resources, and mitigation of major hazards. The RTD action will provide applications, products and services based on earth observation, linked to environmental monitoring and management of resources, land use and ecosystems. The focus will be on meeting the needs of a wide range of users, particularly those in Member State authorities. In this way, earth observation will naturally be integrated with other relevant technologies as required, such as airborne remote sensing, space telecommunications, navigation and global information systems.

The following research priorities will be implemented in line with the objectives of the Centre for Earth Observation initiative:

RTD priorities: innovative pilot applications and focused methodological research to improve the effectiveness of activities in priority areas for EU policies; investigations into technical, legal and economic aspects; requirement and feasibility studies to help specify new services and missions; new scenarios to prepare for self-sustaining operational services; promotion, education and training to make better use of existing and planned earth observation data and information sources,

— **Socioeconomic aspects of environmental change in the perspective of sustainable development (the impact on society, the economy and employment)**

Objectives and RTD activities

The overall aim is to develop a sound scientific basis for, and advance the application and use of, models for sustainable development and to facilitate the integration of sustainability considerations into key EU sectoral policies (industry, transport, tourism, etc.) and into the key actions of the fifth framework programme.

This integration is to be achieved by identification and assessment of the key interrelations between socioeconomic driving forces of technological change, economic globalisation, societal behaviour and environmental change, and their socioeconomic impacts. Effective utilisation of this knowledge in policy formulation depends on the development and testing of improved methods and policy tools.

RTD priorities: identification and evaluation of the key relationships between socioeconomic development and environmental change; driving forces and impacts are to be assessed in terms of policies, institutions, demography, production and consumption, technological development, distribution, security, culture and ethics. Development and application of methods and tools for the integration and promotion of economic, social and environmental objectives; descriptive and performance measures of sustainable development and for environmental accounting; development of sustainable development indicators and analysis of ecological footprints. Design and comparative assessments of various approaches to eco-efficiency, including rational use of

⁽¹⁾ Space-related activities are subject to central coordination across the various programmes.

resources and industrial ecology; sustainable production and consumption; environmental governance principles for sustainability.

(c) SUPPORT FOR RESEARCH INFRASTRUCTURE

Objectives

To encourage the transnational use of public or private facilities which address critical needs in order to further improve their exploitation while avoiding unnecessary duplication, and to cover emerging priority needs.

Activities

In order to reinforce the European added-value and optimise the efforts made, the Community support will be directed towards:

- transnational coordination, integrated management of specific aspects of operation, access to and improvement of existing facilities,
- coordination and complementarity of national or multinational initiatives to support facilities needed at the European level,
- networking of communities of researchers and users through research projects and specific training activities centred on appropriate infrastructures, or cooperation of several partners to form an integrated service provider,
- increasing the compatibility of dispersed systems aiming to provide rapid and effective integration of facilities and resources.

Infrastructure

Supporting infrastructure for assessing and observing the earth systems (e.g. ocean), in order to improve prediction of natural hazards and global changes will include more specifically:

- climate and global change research facilities: centres for climate prediction, super-computer facilities; archiving facilities; centres for integrated assessment; climate and global change databases; simulation chambers, ground-based stations and aircraft for the observation of atmosphere; devices and networks for observation of palaeo-environmental information; support to taxonomy,
- marine research facilities: marine databases; collection of marine samples, support to taxonomy; test basins; research vessels; platforms and centres for forecasting of ocean state; manned, robotic, and automatic observation systems,
- natural hazards research facilities: facilities and key operational networks for data on earthquakes, floods, tidal waves and storms, landslides, volcanoes and forest fires.

B. ENERGY

The strategic goal of this part of the programme is to develop sustainable energy systems and services for Europe and contribute to a more sustainable development worldwide, leading to increased security and diversity of supply, the provision of high-quality, low-cost energy services, improved industrial competitiveness and reduced environmental impact.

The RTD and demonstration projects will concentrate through two key actions on tackling the issues of cleaner energy systems including renewable energies and economical and efficient energy for a

competitive Europe as well as generic activities concerning the socioeconomic aspects of energy within the perspective of sustainable development (the impact on society, the economy and employment).

(a) KEY ACTIONS

(i) Cleaner energy systems, including renewables

Objectives and RTD priorities

The aim of this key action is to develop and demonstrate technologies and associated measures which will help minimise the environmental impact of the production and use of energy in Europe and be consistent with the energy policy objectives, including the reduction of the Community's dependence on imported energy. These will help preserve the ecosystem by reducing emissions at local and global levels and increasing the share of new and renewable energies. Accordingly 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 on:

- *Large-scale generation of electricity and/or heat with reduced CO₂ emissions from coal, biomass or other fuels, including combined heat and power*

The aim is to obtain substantial improvements in efficiency with reduction of the cost, external dependence and environmental impact of energy conversion processes, whether based on fossil fuels or renewable energy sources.

RTD priorities: combustion and other thermochemical conversion processes (e.g. gasification, pyrolysis); generation of electricity and/or heat with reduced CO₂ emissions from coal, biomass, waste or other fuels; improving the efficiency of gas turbines; combined heat and power,

- *Development and demonstration, including for decentralised generation, of the main new and renewable energy sources, in particular biomass, wind and solar technologies, and of fuel cells*

The aim is to enable the deployment of new and renewable energies in grid connected and 'stand alone' applications where there are prospects of a substantial contribution to energy supplies.

RTD priorities: fuel cells, for both stationary and transport applications; clean conversion and cost-effective use of biomass in the context of energy generation systems for heat and power; wind energy, in both on-shore and off-shore applications; solar technologies, photovoltaics and solar thermal technologies; other renewable energy options that can contribute significantly to overall programme objectives,

- *Integration of new and renewable energy sources into energy systems*

The aim is to overcome the problems associated with integrating new energy sources into established energy systems, develop new applications and overcome barriers to the greater uptake of renewable energies.

RTD priorities: overcoming the technical problems associated with the integration of renewable energy sources into energy grids and processes; hybrid systems, combining different renewables or renewables with conventional systems; improving acceptability of renewables e.g. reducing visual intrusion and noise; identifying, and seeking ways to remove, non-technical barriers to integration of renewables,

— *Cost-effective environmental abatement technologies for power production*

The aim is to reduce the environmental impact of power production focusing on the most polluting energy streams.

RTD priorities: emission abatement technologies for power stations (e.g. for reducing emissions of CO₂, SO_x, NO_x and other pollutants); hot gas cleaning; including understanding of basic scientific phenomena.

(ii) **Economic and efficient energy for a competitive Europe**

Objectives and RTD priorities

The aim of this key action is to provide Europe with a reliable, clean, efficient, safe and economic energy supply for the benefit of its citizens, the functioning of society and the competitiveness of industry. A more efficient use of energy is required with technologies capable of achieving substantial overall cost reductions and reduction of energy intensity, environmental impact and external dependence. Action will need to be taken at all stages of the energy cycle, production, distribution and final use, to improve efficiency and reduce costs. Work will focus on:

— *Technologies for the rational and efficient end use of energy*

The aim is to make a major step towards a sustainable energy system by substantially reducing the energy intensity of demand and making more effective, sustainable use of energy in the built environment, transport and industry (including agriculture). This requires the development and deployment of new technologies, improving existing technologies and dissemination and demonstration aimed at modifying user behaviour. RTD will focus on areas with the greatest potential to deliver sustainable use of energy.

RTD priorities: particular emphasis will be given to cross sectoral technologies, such as process control, and an integrated approach to improving energy efficiency in the built environment, transport and industry, including agriculture; lighting, space heating and cooling and the integration of renewables into buildings; improved energy and environmental performance of vehicles and the corresponding infrastructure, including fuels, energy storage, conversion, combustion and transmission; reduction of energy intensity of industrial processes where emphasis will be given to process integration, separation and drying,

— *Technologies for the transmission and distribution of energy*

The aim is to achieve the full potential of intelligent energy networks in optimising the efficiency of the whole energy system through improving the flexibility, reliability and competitiveness of energy transmission and distribution systems while reducing costs, transmission losses and environmental impact. Emphasis will be given to facilitate the integration of new sources of supply into European energy networks and to contribute to management of, and support to, liberalised energy markets.

RTD priorities: intelligent energy transmission and distribution systems; long-distance transmission of gas and electricity; optimised network management and control systems; optimal system efficiency for electricity, gas, and district heating and cooling systems; superconductivity,

— *Technologies for the storage of energy on both macro and micro scale*

The aim is to improve the efficiency and reduce the environmental impact of energy storage; at the macro scale in order to optimise the benefits of intermittent sources of renewable energy, at the medium-size scale to permit the development of zero-emission vehicles and at the micro scale to enable further downsizing of electronic devices.

RTD priorities: reliable and cost efficient energy storage technologies, including liquefied natural gas and liquefied petroleum gas, H₂, advanced batteries, both macro and micro, for stationary and mobile applications,

— *More efficient exploration, extraction and production technologies for hydrocarbons*

The aim is to allow more efficient identification of the energy resources available within the EU and to optimise their exploitation, reducing the costs and environmental impact of their production with the development of technologies which will be more competitive in global markets.

RTD priorities: improved tools for characterisation and management of hydrocarbon reservoirs; exploration and production technologies for hydrocarbons, especially for hostile subsea locations; reduced environmental impact and improved recovery techniques for hydrocarbons, including those of wider application for example for geothermal energy; recovery of hydrocarbons from coal beds,

— *Improving the efficiency of new and renewable energy sources*

The aim is to achieve the widest possible deployment of renewable energies by reducing the costs of their use in energy production and by advancing our understanding of the availability of renewable resources in Europe, improving the efficiency of the technologies and reducing the costs of their manufacture.

RTD priorities: biomass exploitation and management of waste as a fuel resource; improving efficiencies of photovoltaic cells and wind turbines; reducing costs of production of renewables technologies (e.g. turbine blades, PV modules),

— *The elaboration of scenarios on supply and demand technologies 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*

The aim is to develop strategies for the production and use of energy, for the introduction of new energy technologies and for policy development.

RTD priorities: long- and short-term scenario analysis at the global, Community, and regional level of supply and demand in the context of economic developments, social and environmental needs; modelling and policy impact analysis; overall assessment of energy markets and technology impacts taking into account the operation of liberalised energy markets.

(b) **RESEARCH AND TECHNOLOGICAL DEVELOPMENT ACTIVITIES OF A GENERIC NATURE**

— Socioeconomic aspects of energy within the perspective of sustainable development (the impact on society, the economy and employment)

Objectives and RTD priorities

The aim is to develop and apply tools for assessing and monitoring the socioeconomic aspects of energy technologies, systems and services using a 'technology assessment' approach at the project level and a 'global systems analysis' approach at a much more general level.

RTD priorities: for technology assessment, the social dimension (e.g. behaviour, acceptance), the innovation dimension, including the 'command and control' measures and the impact of other policies, the assessment of the externalities and their internalisation and, finally, comparative assessment; for systems analysis, the understanding of the relationship between energy, environment, technologies and economic growth taking into account societal values and natural and human resources.

*ANNEX III***SPECIFIC RULES FOR IMPLEMENTING THE PROGRAMME**

The specific programme will be implemented through the indirect RTD actions as provided for in Annexes II and IV to the fifth framework programme. In addition, the following rules specific to this programme will apply:

1. Accompanying measures

The accompanying measures will comprise in particular:

- studies on support of the specific programme, including the preparation of future activities,
- the exchange of information, conferences, seminars, workshops and scientific and technical meetings,
- recourse to external expertise, including access to scientific databases, in particular for the purposes of the monitoring of the specific programme provided for in Article 5(1) of the fifth framework programme, the external assessment provided for in Article 5(2) of the fifth framework programme and the evaluation of indirect RTD actions and the monitoring of their implementation,
- dissemination, information and communication activities, including scientific publications, activities for the exploitation of results and the transfer of technologies, encouragement of innovation financing and assistance with the protection of intellectual property,
- training schemes related to RTD activities covered by the specific programme other than Marie Curie fellowships,
- support for schemes to provide information and assistance for research players, including SMEs, and including the development of closer international scientific cooperation,
- support for promotion of common data structures and for data compatibility, standardisation, processing, management and exchange,
- recourse to external expertise in setting up and providing access to information, assistance and innovation promoting services and networks.

2. Financial participation rates

In the specific case of RTD projects, demonstration projects and integrated projects, the costs of use of research vessels, off-shore platforms and airborne platforms will be eligible costs. Details of these costs are set out in the work programme.

3. Additional rules for participation and dissemination

This programme is also open to legal entities established in third countries and international organisations which may participate on a project-by-project basis provided their participation contributes effectively to the implementation of the programme.

Such entities and international organisations may exceptionally receive financial support where their participation is beneficial and offers added-value for achieving the objectives of the programme.

4. Coordination arrangements

The Commission will endeavour to ensure complementarity between the indirect RTD actions under the programme, in particular by grouping them around a common objective, and to avoid duplication, while respecting the legitimate interests of proposers of indirect RTD actions. In this context, coordination will also be ensured by the two programme committees as appropriate.

As far as possible, coordination will also be ensured between actions under the specific programme and those carried out in:

- other specific programmes implementing the fifth framework programme,
- the research and training programmes implementing Council Decision 1999/64/Euratom of 22 December 1998 concerning the fifth framework programme of the European Atomic Energy Community (Euratom) for research and training activities (1998 to 2002)⁽¹⁾,
- other European research frameworks including Eureka and COST,
- other Community research-related instruments.

It will comprise:

- (i) the identification of common themes or priorities, resulting in particular in:
 - exchange of information,
 - the carrying out of work decided on jointly, entailing in particular the joint initiation of one of the procedures referred to in Article 9 of the rules for participation and dissemination;
- (ii) the reassignment of proposals for indirect RTD actions between specific programmes or between a specific programme and a research and training programme.

⁽¹⁾ OJ L 26, 1.2.1999, p. 34.

COUNCIL DECISION

of 25 January 1999

adopting a specific programme on confirming the international role of Community research
(1998 to 2002)

(1999/171/EC)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 130i(4) thereof,

Having regard to the proposal from the Commission⁽¹⁾,Having regard to the opinion of the European Parliament⁽²⁾,Having regard to the opinion of the Economic and Social Committee⁽³⁾,

(1) Whereas by Decision No 182/1999/EC⁽⁴⁾, the European Parliament and the Council adopted the fifth framework programme of the European Community (hereinafter referred to as the fifth framework programme) for research, technological development and demonstration (hereinafter referred to as RTD) activities for the period 1998 to 2002 setting out the general outlines and scientific and technological objectives of the activities to be carried out in the field of international RTD cooperation;

(2) Whereas Article 130i(3) of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity under the framework programme, and that each specific programme shall define the detailed rules for implementing it, fix its duration and provide for the means deemed necessary;

(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⁾ and Article 4(2) of the Council Decisions on the specific programmes implementing the fourth framework programme, the Commission has arranged for an external assessment to be conducted which it has transmitted to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions together with its conclusions and comments;

(4) Whereas, in accordance with Article 130j of the Treaty, Council Decision 1999/65/EC of 22 December 1998 concerning the rules for the participation of undertakings, research centres and universities and for the dissemination of research results for the implementation of the fifth framework programme of the European Community (1998 to 2002)⁽⁶⁾ (hereinafter referred to as 'the rules for participation and dissemination') applies to this specific programme; whereas these rules allow the participation of the Joint Research Centre in the indirect actions covered by this specific programme;

(5) Whereas, for the purpose of implementing the international cooperation activities under this programme, in addition to the cooperation covered by the Agreement on the European Economic Area, it may be appropriate to engage in agreements with third countries or international organisations, in particular on the basis of Article 130m of the Treaty;

(6) Whereas RTD is of special significance in achieving improved levels of quality of life in many developing countries, and whereas Community action should be of special significance in its contribution to improving the living standards of citizens in the countries concerned, their health and the state of the environment, improved prosperity, and sustainable development;

⁽¹⁾ OJ C 260, 18.8.1998, p. 65.

⁽²⁾ Opinion delivered on 15 December 1998 (not yet published in the Official Journal).

⁽³⁾ OJ C 407, 28.12.1998, p. 123.

⁽⁴⁾ OJ L 26, 1.2.1999, p. 1.

⁽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).

⁽⁶⁾ OJ L 26, 1.2.1999, p. 46.

- (7) Whereas scientific information networks can have a particular impact on the various aspects of international RTD cooperation;
- (8) Whereas implementation of this programme will also comprise activities and mechanisms aimed at stimulating, disseminating and exploiting RTD results, in particular *vis-à-vis* small and medium-sized enterprises (SMEs), and activities to stimulate the mobility and training of researchers;
- (9) Whereas the equal opportunities policy of the Community must be taken into account in the implementation of this programme;
- (10) Whereas efficient and transparent management contributes to a more effective and user-friendly programme;
- (11) Whereas administrative expenditure should be included in the Community budget in a transparent fashion;
- (12) Whereas the implementation of this programme should be monitored with a view to adapting it, where appropriate, to scientific and technological developments; whereas in due course there should also be an assessment of progress with the programme by independent experts;
- (13) Whereas the Scientific and Technical Research Committee has been consulted on the scientific and technological content of the specific programmes,

HAS ADOPTED THIS DECISION:

Article 1

In accordance with Article 3(1) of the fifth framework programme, the specific programme on confirming the international role of Community research (hereinafter referred to as the specific programme) is adopted for the period from 25 January 1999 to 31 December 2002.

Article 2

1. In accordance with Annex III to the fifth framework programme, the amount deemed necessary

for carrying out the specific programme is EUR 475 million, including a maximum of 9,8% for the Commission's administrative expenditure.

An indicative breakdown of this amount is given in Annex I.

2. Of the amount in paragraph 1

— EUR 78 million is for the period 1998 to 1999,

and

— EUR 397 million is for the period 2000 to 2002.

In the case referred to in Article 2(1)(c) of the fifth framework programme, the Council shall adapt the latter figure in accordance with Article 2(1)(c), second indent of the fifth framework programme. Pending a decision by the Council, this specific programme shall not be implemented beyond the provision of the first indent.

3. The budgetary authority shall, in compliance with the scientific and technological objectives and priorities laid down in this Decision, set the appropriations for each financial year taking into account the availability of resources within the multiannual financial perspective.

Article 3

1. The general outlines, the scientific and technological objectives and the priorities for the specific programme are set out in Annex II. They are consistent with the principles and the three categories of selection criteria indicated in Annex I to the fifth framework programme.

2. In accordance with these principles and criteria the selection criteria indicated in Article 10 of the rules for participation and dissemination shall be applied for the selection of the RTD activities to be carried out.

All these criteria shall be complied with in the implementation of the programme, including the work programme referred to in Article 5(1), although they may be weighted differently.

3. The rules for participation and dissemination shall apply to the specific programme.

4. The detailed rules for financial participation by the Community in the specific programme are those referred to in Article 4 of the fifth framework programme.

The indirect RTD actions under the specific programme are defined in Annexes II and IV to the fifth framework programme.

Specific rules for implementing the programme are set out in Annex III to this Decision.

Article 4

In the light of the criteria referred to in Article 3, and the scientific and technological objectives and priorities set out in Annex II, the Commission:

- (a) shall monitor, with appropriate assistance from independent external experts, the implementation of the specific programme and, where appropriate, submit proposals to Council for adapting it, in accordance with Article 5(1) of the fifth framework programme;
- (b) shall arrange for the external assessment provided for in Article 5(2) of the fifth framework programme to be conducted concerning the activities carried out in the fields covered by the specific programme.

Article 5

1. The Commission shall draw up a work programme specifying:

- (a) in greater detail, the objectives and RTD priorities of Annex II;
- (b) the indicative timetable for the implementation of the specific programme;
- (c) the coordination arrangements set out in Annex III;
- (d) where necessary, the selection criteria and the arrangements for applying them for each type of indirect RTD action.

2. The work programme shall serve as a basis for implementing the indirect RTD actions according to the procedures set out in the rules for participation and dissemination.

3. The work programme shall be updated where appropriate and be made available by the Commission to all interested parties in a user-friendly form, including in electronic form.

Article 6

1. The Commission shall be responsible for the implementation of this specific programme.

2. The procedure laid down in Article 7 shall apply for the adoption of the following measures:

- the drawing-up and updating of the work programme referred to in Article 5(1), including regarding the content of calls for proposals,
- approval of RTD actions proposed for funding, including participation by entities from third countries, where the estimated amount of the Community contribution under this programme is equal to or more than EUR 0,3 million,
- the drawing-up of the terms of reference for the external assessment provided for in Article 5(2) of the fifth framework programme,
- any adjustment to the indicative breakdown of the amount as set out in Annex I.

Article 7

1. The Commission shall be assisted by a programme committee (hereinafter referred to as 'the committee') composed of representatives of the Member States and chaired by the representative of the Commission.

2. In the cases referred to in Article 6(2), the representative of the Commission shall submit to the committee a draft of measures to be taken. The committee shall deliver its opinion on the draft measures referred to above within a time limit which the Chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148(2) of the Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The Chairman shall not vote.

3(a) The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee.

(b) If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority.

If, on expiry of a period of nine weeks from the referral of the matter to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

4. The Commission shall regularly inform the committee of the overall progress of the implementation of the specific programme, and shall in particular provide it with information about the progress of all RTD actions funded under this programme.

Article 8

In accordance with Article 5(4) of the fifth framework programme, the Commission shall regularly inform the Council and the European Parliament of the overall progress of the implementation of the programme, including on the participation of SMEs and the simplification of administrative procedures.

Article 9

This Decision is addressed to the Member States.

Done at Brussels, 25 January 1999.

For the Council
The President
J. FISCHER

ANNEX I

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

<i>(million EUR)</i>	
Type of activity	Amount
Cooperation with third countries	
— Pre-accession States	26
— NIS and other CEECs	112 (of which 70 for INTAS)
— Mediterranean partners	55
— Developing countries	210
— Emerging economy countries and industrialised countries	5
Training of researchers	15
Coordination	52
Total	475

ANNEX II

THE GENERAL OUTLINES, THE SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES AND THE PRIORITIES

INTRODUCTION

The main objectives of this horizontal theme are: to promote S/T cooperation internationally; to reinforce Community capacities in the fields of science and technology; to generally support 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 members in mind.

Strategic objectives and approach of the programme

- to promote scientific and technological cooperation between undertakings, organisations and researchers from third countries and from the Community, likely to produce significant, mutual and balanced benefits, taking into account the different needs and circumstances of individual groups of countries and regions while 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 and useful to the Community's interests,
- to enhance the position and role of Community research in the international scientific and technological arena and to promote a European scientific and technological culture, taking account of the social and cultural needs of the countries with which it is cooperating,
- to prepare for the accession of new Member States, e.g. 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 new 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 RTD cooperation will be pursued in two forms in the fifth framework programme: firstly, through this specific programme and secondly, through the other specific programmes, and in close coordination with them.

The specific actions provided for in this programme are as follows:

- to pursue strategically defined activities aimed at the accession candidate countries, other central and east European countries (CEECs), the new independent States of the former Soviet Union (NIS) (excluding the Baltic States) and Mongolia, the Mediterranean partner countries and developing countries. In order to exploit fully the opportunities for cooperation and optimise the added-value at European level, this programme will also facilitate cooperation with certain industrialised and emerging economy countries,
- to increase the opportunities for training of researchers,
- to ensure coordination with other programmes of the framework programme, with other Community initiatives and policies, in particular external policies, as well as with policies and programmes of Member States, international organisations and cooperation schemes such as COST and Eureka.

The second form of international cooperation to be pursued will be the participation of partners from outside the Union (without funding from this specific programme) in projects of the other programmes in accordance with the participation and dissemination rules.

1. SPECIFIC ACTIVITIES IN THE PROGRAMME

This programme will finance only specific RTD activities which are relevant to certain third countries or regions and which are not addressed by the other parts of the framework programme. Research priorities will be identified through a strengthened dialogue and cooperation with the regions concerned, taking into account any cooperation agreements and the diversity of their economic and sociocultural situations and needs. Support will focus on research and technological development cooperation rather than on technical assistance or technology transfer which can be better achieved through Community external relations programmes. In the implementation of this programme, the concerns of industry and in particular of small and medium-sized enterprises will be taken into account.

A. COOPERATION WITH CERTAIN CATEGORIES OF THIRD COUNTRIES

A.1. States in the pre-accession phase

Rationale and objectives

The period covered by the fifth framework programme will coincide with the preparation for membership of the European Union by the accession candidate countries. In the context of Agenda 2000, the objective of this programme is thus to help accelerate the reform in their science structures, while safeguarding the highly qualified human resources and enhancing their RTD potential. This will be pursued by encouraging these countries to become associated with the specific programmes and to participate in projects under similar conditions to Member States. In view of the reinforced pre-accession strategy proposed under Agenda 2000, this association with the framework programme could be facilitated by a reduced, but progressively increasing, financial contribution required from these countries⁽¹⁾ and by making use, where so decided, of other relevant Community instruments.

Activities

- Specific activities will be undertaken to promote existing centres of excellence in these countries in order to put their research capabilities at the service of the economic and social needs of their region and in conformity with the interests of the Union as a whole. The centres to be supported should bring together theoretical and applied research, including research in the natural, social and economic sciences, where possible using a multi-disciplinary approach. They should link local expertise and international excellence and should also serve young researchers as training centres. Support will be provided for schemes consisting of measures such as networking, conference and workshop organisation and visiting scientists. This will enable cooperation with western scientists *in situ*, and the establishment of programmes and events to highlight the 'supraregional' relevance of the centres, thus strengthening their attraction for neighbouring countries,
- In addition, accompanying measures will be developed to strengthen the participation of these countries in other programmes of the framework programme (e.g. dissemination of information on opportunities offered by the framework programme), making use also of cooperation networks.

A.2. NIS and CEECs not in the pre-accession phase

Rationale and objectives

Closer relationships between these countries and the Union in science and technology will help maintain and stimulate their economic development. A number of these countries have made substantial efforts to consolidate the existing scientific potential and to provide new administrative

⁽¹⁾ The 10 countries of central and eastern Europe plus Cyprus.

structures more suitable to research needs. The Union's objectives in scientific cooperation with these countries are to support efforts to develop a pluralistic scientific and technological system and to preserve and develop their research excellence by building on existing expertise in order to help them solve some of their major economic and societal problems.

Activities

This programme will undertake joint research projects and concerted actions in areas not covered by the other specific programmes, in two forms:

- support for their research and technological development potential and promotion of cooperation with the European scientific community, including through the International Association for the Promotion of Cooperation with Scientists from the Independent States of the Former Soviet Union (INTAS) for the NIS, provided that a new agreement is reached between its members on its continuation. These activities will be carried out in the fields where these countries have a recognised excellence and valuable cooperation potential. In this context, whilst respecting its legal status, INTAS intends also to explore, where appropriate, the possibilities of the exploitation of project results,
- cooperation in areas of mutual interest will be continued both with these CEECs and with the NIS, building on the experience already gained in the Copernicus programme. Research will include the following areas: regional problems linked to the environment and health; structural problems of transition and socioeconomic development; sustainable use of natural resources such as: desertification, rehabilitation of land-locked sea areas and large lakes, consequences of past approaches to energy production and use, Arctic environment management, exposure of humans to environmental agents, air pollution and water quality, prevention and control of re-emerging diseases, reform of the health services system, satellite application, sustainable forestry; they may also address problems concerning the reorientation of the science and technology sector including the reorientation of socioeconomic research.

A.3. Mediterranean partner countries

Rationale and objectives

In addition to their participation in the other specific programmes and in the specific action for research for development of this programme, certain specific actions will be undertaken with the Mediterranean partner countries in order to strengthen the research and technology dimension of the Euro-Mediterranean partnership, improving where appropriate their research and technological development capabilities and promoting innovation.

Activities

Without prejudice to the possibilities for cooperation with other specific programmes and taking into account the continuous dialogue with these countries (e.g. in the context of the 'Barcelona process'), specific activities will be undertaken concerning regional aspects of in particular the following areas: integrated coastal zone management in the Mediterranean (including environmental aspects); water management (including water/energy interactions); natural resource management in the context of sustainable development of tourism; the preservation and restoration of cultural heritage; development in the context of socioeconomic modernisation (including innovation, the urban dimension, health, transport and support for the establishment of a Euro-Mediterranean information society).

A.4. Research for development

Rationale and objectives

The objective of this part of the programme is to tackle, jointly with developing country scientists, research problems linked directly to development challenges in the long-term mutual interest. The selection of topics to be covered will be based on policy dialogues and cooperation with groups of

countries and regions concerning their RTD needs, priorities and specific socioeconomic requirements, taking also into account development policy objectives of the Community and internationally agreed development targets, as well as the experience gained in the fourth framework programme.

Activities

Specific activities will be undertaken in the following areas:

- Mechanisms and socioeconomic and policy conditions for sustainable development:
 - analysis of the factors facilitating the adoption of existing innovations. In addition to the main areas below, this will cover sectoral and intersectoral areas such as the global information society, energy, transport, population, gender-related issues and urbanisation,
- Sustainable management and use of natural resources:
 - promotion of a sustainable relationship between population pressure, food security and the use and management of ecosystems; improvement of the productivity of renewable natural resources and prevention of their degradation,
 - analysis of the evolution in demand for agricultural products in these countries and research on ways of meeting this demand; improvement of the efficiency of agricultural production chains with particular reference to quality and health,
- Health improvement:
 - research on equitable, efficient health systems and their impact; the influence of structural and policy aspects; coverage of vulnerable groups; quality of care and its acceptability and affordability; understanding of the major health problems in these countries and the development of instruments for prevention and control of the predominant diseases.

A.5. Emerging economy and industrialised countries

Rationale and objectives

These countries are both competitors and partners for the Union in the global market place. This part of the programme will promote:

- bilateral as well as multilateral (e.g. G7, OECD) policy dialogue in research in order to facilitate and monitor cooperation as well as to identify priorities of mutual interest,
- access to research know-how and opportunities available in these countries, thereby contributing to the improvement of the performance of European research and the competitiveness of the Union in the global economy,
- the sharing of the costs and benefits of global endeavours (e.g. human genome, information society and activities covered by the agreement on intelligent manufacturing systems, IMS),
- cooperation aimed at the solution of worldwide problems (e.g. global climate change).

Activities

In order to facilitate and enhance access to the research potential which exists outside the Union, for the benefit of the programmes' key actions and generic activities, this programme will implement scientific and technological cooperation agreements in certain areas with certain non-Union industrialised countries. This instrument could also be extended to cooperation in certain areas with

some of the major emerging economy countries, i.e. certain developing countries which represent important markets, and which have developed to the point that in specific scientific and technological areas they are at par with industrialised countries.

B. TRAINING OF RESEARCHERS

A fellowship scheme will be established to allow a limited number of young doctoral level researchers from developing countries, including Mediterranean and emerging economy countries, to work in European laboratories on projects of the framework programme. This will further contribute to the reinforcement of the scientific potential in these countries, while allowing Community research to benefit from their expertise.

Another fellowship scheme will be provided enabling a limited number of young Community researchers to work in industrially-oriented laboratories of the highest quality in non-Union countries in areas of particular interest to the Community. The Community's equal opportunities policy will be taken into account in the implementation of these fellowship schemes.

C. COORDINATION

Coordination of activities within the framework programme and with other Community programmes

In order to define and implement international research cooperation policy, this programme will take into account the policies, instruments, initiatives, interests and capabilities of other actors in this field. A key objective is therefore to ensure coordination with the other specific programmes and with other Community policies and instruments.

- Coordination with the other specific programmes will focus on ensuring consistency of approach to partners from outside the Union across the specific programmes, on monitoring and analysing (in terms of mutual benefit and utility) the participation of non-Union entities or international organisations in the other programmes, and on studying participation trends by country and by programme.

In addition, where there are opportunities for international research cooperation of mutual interest, this programme will help the other programmes in establishing effective cooperation, including the organisation of events aimed at providing information on the rules and policies applicable to Community RTD in general, and to participation of non-Union country entities and international organisations in particular,

- Coordination with the Community's external technical assistance programmes such as PHARE, TACIS, MEDA, EDF and the programmes for Asia and Latin America will increase the synergy between their actions and the work carried out under research policy. This could provide effective support for the scientific and technological sector in the countries concerned.

Coordination with COST, Eureka and international organisations

- **COST:** COST, which extends far beyond the Union, is a useful instrument to foster cooperation and stimulate mutual coordination of national and international activities on a very broad scale, both thematically and geographically, as well as to stimulate the participation of researchers from pre-accession countries into pan-European activities. Its flexibility will continue to be used to intensify exploration of new ideas and fields of scientific and technological endeavour. Improved methods of ensuring complementarity between COST and the framework programme activities will be developed, in order to exploit better the potential for synergy between the two instruments, particularly as concerns the implementation of the key actions and generic activities of the framework programme. The programme will provide technical and financial support for COST administration,

- *Eureka*: framework programme and Eureka activities are complementary. The aim is to maximise, around a limited number of priority themes of common interest, the coordinated use of the two instruments. Simple and efficient ways of linking the fifth framework programme and Eureka will be developed and applied primarily to strategic projects within the key actions of the thematic programmes in conformity with the selection criteria and procedures of the framework programme. Information and coordination mechanisms will be enhanced, so as to foster a positive development of these projects, while maintaining the distinct roles of Eureka and the framework programme as well as their specificities and financial means,
- *international organisations*: closer cooperation between the Community and international organisations involved in research activities and S/T policy development and their participation in activities of the fifth framework programme will strengthen the overall coherence of research in Europe and optimise the use and exploitation of Europe's scientific infrastructures. The Commission will, where appropriate, intensify the Community's involvement in these organisations in particular through encouraging coordination between and with the Member States.

Coordination with Member States

The international research cooperation activities of the Community and the Member States often address similar or related issues. In full respect of the principle of subsidiarity, there is both scope and need for increased coordination in certain areas which would lift the individual efforts above critical mass and enhance overall effectiveness, flexibility and visibility of Community and Member States' activities. Building on the experience of initiatives such as the 'European initiative on agricultural research for development', coordination activities can be supported through this programme in public and industrial research areas where a need has been identified.

2. INTERNATIONAL COOPERATION PURSUED THROUGH THE OTHER FRAMEWORK PROGRAMME ACTIVITIES

The second form of international RTD cooperation referred to in the introduction concerns participation of third country entities and international organisations in the other specific programmes of the framework programme without funding from this specific programme. The rules for such participation are set out in the Decision pursuant to Article 130j of the Treaty. This programme will monitor the extent of this participation and its benefit to the Community as well as its conformity with the Community's external policy also with the accession of new members in mind. It will also assess whether such participation should be subject to the conclusion of an international agreement in order to provide equitable access for Community researchers to high quality RTD programmes in the third countries concerned and/or to ensure adequate arrangements for intellectual property rights.

*ANNEX III***SPECIFIC RULES FOR IMPLEMENTING THE PROGRAMME**

The specific programme will be implemented through the indirect RTD actions defined in Annexes II and IV to the fifth framework programme. In addition, the following rules specific to this programme will apply:

1. Accompanying measures

The accompanying measures will comprise in particular:

- studies in support of the specific programme, including the preparation of future activities,
- the exchange of information, conferences, seminars, workshops and scientific and technical meetings,
- recourse to external expertise, including access to scientific databases, in particular for the purposes of the monitoring of the specific programme provided for in Article 5(1) of the fifth framework programme, the external assessment provided for in Article 5(2) of the fifth framework programme and the evaluation of indirect RTD actions and the monitoring of their implementation,
- dissemination, information and communication activities, including scientific publications, and activities for the exploitation of results,
- training schemes related to RTD activities covered by the specific programme,
- support for schemes to provide information and assistance for research players, including SMEs,
- support for initiatives to promote centres of excellence.

2. Exceptions from the financial participation rates

In the case of legal entities established in non-associated CEECs, Mediterranean partner countries, NIS and developing countries:

- funding of RTD projects under the fifth framework programme may exceed 50 % of the eligible total costs in order to ensure the quality of their materials and research equipment,
- the expenditure on staff and equipment set out in the detailed rules for participation and dissemination may be extended in the case of participation in the RTD projects on the basis of eligible additional costs,

in accordance with the objectives of the specific programme.

3. Coordination arrangements

The Commission will endeavour to ensure complementarity between the indirect RTD actions within the programme, in particular by grouping them around a common objective, and to avoid duplication, while respecting the legitimate interests of proposers of indirect RTD actions.

Coordination will also be ensured between actions under the specific programme and those carried out in:

- other specific programmes implementing the fifth framework programme,

- the research and training programmes implementing Council Decision 1999/64/Euratom of 22 December 1998 concerning the fifth framework programme of the European Atomic Energy Community (Euratom) for research and training activities (1998 to 2002) ⁽¹⁾,
- other European research frameworks such as Eureka and COST and by international organisations,
- other Community research-related instruments such as PHARE, TACIS, MEDA, EDF, the programmes for Asia and Latin America, the EIF, the Structural Funds and the EIB.

It will comprise:

- (i) the identification of common themes or priorities, resulting in particular in:
 - the exchange of information,
 - the carrying out of work decided on jointly, entailing in particular the joint initiation of one of the procedures referred to in Article 9 of the rules for participation and dissemination,
- (ii) the reassignment of proposals for indirect RTD actions between specific programmes or between a specific programme and a research and training programme.
- (iii) support for the Eureka secretariat and for the COST secretariat ⁽²⁾ and activities.

⁽¹⁾ OJ L 26, 1.2.1999, p. 34.

⁽²⁾ Given the nature of COST, expenditure relating to the secretariat (non-statutory staff, missions, meetings, information, etc.) will be treated as operating expenditure.

COUNCIL DECISION

of 25 January 1999

**adopting a specific programme for research, technological development and demonstration
on promotion of innovation and encouragement of SME participation (1998 to 2002)**

(1999/172/EC)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 130i(4) thereof,

Having regard to the proposal from the Commission⁽¹⁾,

Having regard to the opinion of the European Parliament⁽²⁾,

Having regard to the opinion of the Economic and Social Committee⁽³⁾,

- (1) Whereas by Decision No 182/1999/EC⁽⁴⁾, the European Parliament and the Council adopted the fifth framework programme of the European Community (hereinafter referred to as the fifth framework programme) for research, technological development and demonstration (hereinafter referred to as RTD) activities for the period 1998 to 2002 setting out the general outlines and scientific and technological objectives of the activities to be carried out in the field of promotion of innovation and encouragement of SME participation;

- (2) Whereas Article 130i(3) of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity under the framework programme, and that each specific programme shall define the detailed rules for implementing it, fix its duration and provide for the means deemed necessary;

- (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⁾ and Article 4(2) of the Council Decisions on the specific programmes implementing the fourth framework programme, the Commission has arranged for an external assessment to be conducted which it has transmitted to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions together with its conclusions and comments;

- (4) Whereas, in accordance with Article 130j of the Treaty, Council Decision 1999/65/EC of 22 December 1998 concerning the rules for the participation of undertakings, research centres and universities and for the dissemination of research results for the implementation of the fifth framework programme of the European Community (1998 to 2002)⁽⁶⁾ (hereinafter referred to as 'the rules for participation and dissemination') applies to this specific programme; whereas these rules allow the participation of the Joint Research Centre in the indirect actions covered by this specific programme;
- (5) Whereas, for the purpose of implementing this programme, in addition to cooperation covered by the Agreement on the European Economic Area or by an Association Agreement, it may be appropriate to engage in international cooperation activities, in particular on the basis of Article 130m of the Treaty, with third countries or international organisations;
- (6) Whereas it is important that the scientific, industrial and user communities should contribute substantially to the definition of activities to be undertaken and should be involved, as appropriate, in the implementation of this programme;
- (7) Whereas activities under this programme should also be geared towards innovation in order to

⁽¹⁾ OJ C 260, 18.8.1998, p. 75.

⁽²⁾ Opinion delivered on 15 December 1998 (not yet published in the Official Journal).

⁽³⁾ OJ C 407, 28.12.1998, p. 123.

⁽⁴⁾ OJ L 26, 1.2.1999, p. 1.

⁽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).

⁽⁶⁾ OJ L 26, 1.2.1999, p. 46.

contribute, *inter alia*, to the objectives of the first action plan for innovation;

(8) Whereas special emphasis should be placed on encouraging the participation of SMEs;

(9) Whereas the equal opportunities policy of the Community must be taken into account in the implementation of this programme;

(10) Whereas efficient and transparent management contributes to a more effective and user-friendly programme;

(11) Whereas administrative expenditure should be included in the Community budget in a transparent fashion;

(12) Whereas the implementation of this programme should be monitored with a view to adapting it, where appropriate, to scientific and technological developments; whereas in due course there should also be an assessment of progress with the programme by independent experts;

(13) Whereas the Scientific and Technical Research Committee has been consulted on the scientific and technological content of the specific programmes,

HAS ADOPTED THIS DECISION:

Article 1

In accordance with Article 3(1) of the fifth framework programme, the specific programme on quality of life and management of living resources (hereinafter referred to as the specific programme) is adopted for the period from 25 January 1999 to 31 December 2002.

Article 2

1. In accordance with Annex III to the fifth framework programme, the amount deemed necessary for carrying out the specific programme is EUR 363 million, including a maximum of 7,35 % for the Commission's administrative expenditure.

An indicative breakdown of this amount is given in Annex I.

2. Of the amount in paragraph 1

— EUR 78 million is for the period 1998 to 1999,

and

— EUR 285 million is for the period 2000 to 2002.

In the case referred to in Article 2(1)(c) of the fifth framework programme, the Council shall adapt the latter figure in accordance with Article 2(1)(c), second indent of the fifth framework programme. Pending a decision by the Council, this specific programme shall not be implemented beyond the provision of the first indent.

3. The budgetary authority shall, in compliance with the scientific and technological objectives and priorities laid down in this Decision, set the appropriations for each financial year taking into account the availability of resources within the multiannual financial perspective.

Article 3

1. The general outlines, the scientific and technological objectives and the priorities for the specific programme are set out in Annex II. They are consistent with the principles and the three categories of selection criteria indicated in Annex I to the fifth framework programme.

2. In accordance with these principles and criteria the selection criteria indicated in Article 10 of the rules for participation and dissemination shall be applied for the selection of the RTD activities to be carried out.

In addition, any participation of industrial entities in industrially-orientated shared-cost actions should, as a general rule, be appropriate to the nature and purpose of the activity.

All these criteria shall be complied with in the implementation of the programme, including the work programme referred to in Article 5(1), although they may be weighted differently.

3. The rules for participation and dissemination shall apply to the specific programme.

4. The detailed rules for financial participation by the Community in the specific programme are those referred to in Article 4 of the fifth framework programme.

The indirect RTD actions under the specific programme are defined in Annexes II and IV to the fifth framework programme.

Specific rules for implementing the programme are set out in Annex III to this Decision.

Article 4

In the light of the criteria referred to in Article 3, and the scientific and technological objectives and priorities set out in Annex II, the Commission:

- (a) shall monitor, with appropriate assistance from independent external experts, the implementation of the specific programme and, where appropriate, submit proposals to Council for adapting it, in accordance with Article 5(1) of the fifth framework programme;
- (b) shall arrange for the external assessment provided for in Article 5(2) of the fifth framework programme to be conducted concerning the activities carried out in the fields covered by the specific programme.

Article 5

1. The Commission shall draw up a work programme specifying:

- (a) in greater detail, the objectives and RTD priorities of Annex II;
- (b) the indicative timetable for the implementation of the specific programme;
- (c) the coordination arrangements set out in Annex III;
- (d) where necessary, the selection criteria and the arrangements for applying them for each type of indirect RTD action.

2. The work programme shall take account of relevant interests, in particular the scientific, industrial and user communities. It shall serve as a basis for implementing the indirect RTD actions according to the procedures set out in the rules for participation and dissemination.

3. The work programme shall be updated where appropriate and be made available by the Commission to all interested parties in a user-friendly form, including in electronic form.

Article 6

1. The Commission shall be responsible for the implementation of this specific programme.

2. The procedure laid down in Article 7 shall apply for the adoption of the following measures:

- the drawing-up and updating of the work programme referred to in Article 5(1), including regarding the content of calls for proposals,
- approval of RTD actions proposed for funding, including participation by entities from third countries, where the estimated amount of the Community contribution under this programme is equal to or more than EUR 0,3 million,
- the drawing-up of the terms of reference for the external assessment provided for in Article 5(2) of the fifth framework programme,
- any adjustment to the indicative breakdown of the amount as set out in Annex I.

Article 7

1. The Commission shall be assisted by a programme committee (hereinafter referred to as 'the committee') composed of representatives of the Member States and chaired by the representative of the Commission.

2. In the cases referred to in Article 6(2), the representative of the Commission shall submit to the committee a draft of measures to be taken. The committee shall deliver its opinion on the draft measures referred to above within a time limit which the Chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148(2) of the Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The Chairman shall not vote.

3(a) The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee.

(b) If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority.

If, on expiry of a period of nine weeks from the referral of the matter to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

4. The Commission shall regularly inform the committee of the overall progress of the implementation of the specific programme, and shall in particular provide it with information about the progress of all RTD actions funded under this programme.

Article 8

In accordance with Article 5(4) of the fifth framework programme, the Commission shall regularly inform the Council and the European Parliament of the overall progress of the implementation of the programme, including on the participation of SMEs and the simplification of administrative procedures.

Article 9

This Decision is addressed to the Member States.

Done at Brussels, 25 January 1999.

For the Council
The President
J. FISCHER

ANNEX I

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

<i>(million EUR)</i>	
Type of activity	Amount
Promotion of innovation	119
Encouraging SME participation	44
Joint innovation/SME activities	200
Total	363

ANNEX II

THE GENERAL OUTLINES, THE SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES AND THE PRIORITIES

INTRODUCTION

Innovation is a key factor in industrial competitiveness, sustainable economic and social development and job creation. It is a complex phenomenon involving many players (firms, universities, research centres and financial operators, etc.) and is an important component of behavioural developments and overall social dynamics. Business competitiveness depends to a large extent on the ability to innovate: as a result of the development of new products and services, costs can be contained and competition can be handled. In the information technology sector, for example, 78 % of income is derived from products that have been on the market for two years or less. It is therefore essential to promote innovative activities, including the creation of innovative businesses, and to facilitate the dissemination and exploitation of research results and support technology transfer. Europe needs to exploit more effectively its research activities and its high level of creativity in terms of knowledge and know-how in order to give the economy and society the full benefit of this. It is vital that the research effort should be accompanied and guided by ambitious innovation policies at Community, national and regional levels in all sectors.

Small and medium-sized enterprises (SMEs) are important innovation vectors and players. They play an essential role in the European economy and their development can make a vital contribution to the emergence of new activities, the competitiveness of European industry, economic growth and employment; they also have special features which necessitate appropriate stimulation and follow-up measures. Where necessary, action at European level should supplement initiatives taken by the Member States, in order to help SMEs to gain access to new technologies on the widest transnational basis, be they high-tech SMEs or SMEs which, though having little or no research capacities of their own, need to make use of new technologies developed by others.

Promoting innovation and encouraging SME participation, although not synonymous, are closely linked activities. This programme will therefore help to optimise the efforts devoted to these two themes.

Strategic objective of the programme

In the context of the general objectives set out in Annex II (third activity) of the fifth framework programme, the aim of this programme is to promote innovative activities contributing towards the implementation of the first action plan for innovation, and to promote a more active role for, and facilitate and encourage participation of SMEs in the fifth framework programme.

LINKS WITH OTHER COMMUNITY PROGRAMMES AND ACTIVITIES

The activities carried out in this programme must not duplicate activities undertaken within Member States. They will support, supplement and coordinate activities carried out under other specific programmes or, where appropriate, in the context of other Community activities. The other programmes will contribute actively to the attainment of the strategic objectives. In particular, this programme will promote and coordinate activities carried out in relation to innovation and SMEs, notably in coherence with the SME policy.

On the basis of the measures, instruments and expertise developed in the context of its specific activities, it will in particular focus on the design of mechanisms to facilitate the exploitation and transfer of results, the participation of SMEs, the evaluation of results, and the post-auditing of their exploitation in order to evaluate their economic and social impact. Action in the context of this

programme will be based in particular on the activities carried out by the 'innovation units', located within the thematic programmes, which it will coordinate in order to integrate the innovation dimension in the implementation of the programmes.

COORDINATION ACTIVITIES RELATING TO INNOVATION AND SME PARTICIPATION

Objectives

The aim is to coordinate and support the efforts under the thematic programmes to promote and integrate the 'innovation' and 'SME' dimensions when setting their priorities, establishing their work programmes, and carrying out their activities; to ensure the overall consistency of activities relating to innovation and SMEs and their harmonisation within the thematic programmes, and to ensure the optimum use of skills, experience and infrastructure (including innovation relay centres (IRCs) and CRAFT contact points) existing at the horizontal level or in other programmes.

Activities in the field of innovation

In order to achieve the strategic objective of the programme, the bulk of the work will be carried out within the thematic programmes under the impulse of the innovation units so as to take account of the specific features of the research topics and ensure the best possible match between the exploitation of results and their application context.

Firstly, the programme will ensure synergy between the innovation units, and will interact with the thematic programmes in respect of the definition and implementation of their specific tasks, which should include:

- providing support for activities carried out with regard to innovation, such as the follow-up of technology transfer and the launch of projects with a demonstration effect,
- exploiting the thematic networks, activities and mechanisms stimulating the utilisation and transfer of results or the creation of innovative firms, for example by facilitating access to private funding,
- organising studies to evaluate projects and their results with a view to promoting their exploitation, in particular through a technology implementation plan,
- providing monitoring and evaluation data on technology transfer and other innovation activities within the thematic programmes.

Secondly, this programme will contribute, together with the thematic programmes, to defining the methods and mechanisms contributing towards an increase in the exploitation of the results of the research projects under these programmes and ensuring the coherence and effectiveness of the dissemination of information on the research and development projects and results via the horizontal network and service infrastructures (Cordis, IRCs).

Activities to increase the participation of SMEs

The strategic objective of the programme entails the coordination of support for SME participation in RTD and demonstration activities carried out in the framework of the thematic programmes:

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

- schemes to support and encourage SME participation in collaborative and cooperative research projects (for example on the basis of subsidies for the preparatory phase known as ‘exploratory awards’), respecting SMEs’ need for a flexible and easily accessible support system,
- provision of monitoring and evaluation data on the operation of SME measures within the thematic programmes.

These schemes aimed at encouraging and facilitating SME participation in RTD activities relate to all the objectives and priorities of the specific programmes in their entirety.

In addition, the programme will provide support for organising and improving the dissemination and exploitation of results within the thematic programmes, in order, among other things, to facilitate SME participation in validation and demonstration projects in the context of the key actions.

ACTIVITIES SPECIFIC TO THE HORIZONTAL PROGRAMME

Promotion of innovation

Supplementing the activities carried out within the thematic programmes, the specific activities will help to promote a favourable environment for innovation in Europe and to establish a framework enabling a large number of economic operators to benefit from innovation. It will, where necessary, ensure the transnational dissemination and utilisation of results and technologies not stemming from the thematic programmes.

(i) *Making better use of the results of Community research*

Objective

The aim is to increase the level of use made of the results of research and thus to contribute to the general objective of improving the economic and social impact of framework programme activities.

Activities

- identification and design of mechanisms to facilitate, in the life-cycle of projects, the protection of knowledge acquired, the exploitation or transfer of the technologies and results produced and access to methods of private financing making it possible to ensure that use is made of the results. Organisational changes liable to promote innovation will also be encouraged,
- organisation of exchanges of information and good practices between programmes,
- promotion of the implementation of these mechanisms by other programmes, in particular with the assistance of the innovation units.

(ii) *New approaches to technology transfer*

Objective

The European Union’s inadequate performance as far as innovation is concerned is to a large extent attributable to the uneven development in Europe of the ‘innovation culture’. This culture can be developed by supporting technology transfer projects and encouraging experiments concerning the transfer of technology on an international scale.

The aim is, in harmony with the activities carried out under the thematic programmes, to develop, validate and implement methodologies in the context of pilot/demonstration technology-transfer projects, taking into account the features of particular sectors of activity.

Activities

- promoting the take-up of new technologies, and analysing the technological, economic, organisational and social aspects observed in this process,
- contributing to the transnational dissemination and utilisation of results not arising from the specific programmes, by technology transfer and validation projects.

These activities could include an international dimension (international technology-transfer trials in collaboration with other Community initiatives) and seek to explore new forms of technology transfer.

(iii) *Studies and good practices*

Objectives

To bridge the innovation gap, the Community should identify, analyse and promote the application of good innovation practices.

The aim is to analyse and benchmark innovation performances and policies in a common reference framework and promote concertation, exchanges, and the dissemination and application of good practices.

Activities

- collection and regular updating of information on innovation policies, practices and performances (focusing on the financing, setting-up and development of innovative businesses and protection and transfer of technology); establishment on this basis of an innovation trend chart, in accordance with the action plan for innovation in Europe, and appropriate publications arising therefrom,
- promotion of good practices with regard to innovation (including on the financing, setting-up and development of innovative businesses, protection and transfer of technology, and the regional dimension), including design of training schemes.

Encouraging SME participation

(i) *A single complementary entry point*

Objective

The aim is to make it easier for SMEs to take part in Community programmes by offering them an additional means of access, a single complementary entry point, common to all the programmes and making full use of existing support networks, such as IRCs and CRAFT national focal points in Member States.

Activities

Setting-up of a structure to facilitate SME participation in Community programmes by enabling them:

- to be made aware of the importance and impact of Community RTD activities and make their needs known,
- to receive information about the programmes and have access to assistance with the preparation of proposals (including help with the creation of consortiums and with forwarding their proposals to the most appropriate programme),

- to submit proposals at any time, in the context of a permanently open call, with a view to benefiting from measures specific to them, such as exploratory awards or 'cooperative research' activities (CRAFT),
- to receive structured and rapid feedback on their applications.

(ii) *Joint support and assistance instruments*

Objective

The aim is to simplify and harmonise SME participation conditions in order to supplement and strengthen the impact of the single complementary entry point, preferably through the fullest possible use of the most suitable electronic means: electronic information packages and electronic submission of proposals, 'help line', specialised Intranet networks, etc.

Activities

- preparation of joint contractual and information-management tools,
- assistance for SMEs, as required to complement that provided at local and regional level and by thematic programmes, such as the organisation of training workshops for project coordinators and intermediaries on the management of research contracts, the coordination and follow-up of projects or other topics of general interest to SMEs.

(iii) *Economic and technological intelligence*

Objective

The aim is to help SMEs to identify their needs, anticipate technological trends and provide information and analysis to help meet those needs and to direct them towards Community instruments in particular which will enable them to do so.

Activities

- identification of relevant information, using existing sources, on market trends and the state of the art (e.g. through workshops bringing together suppliers, users, SMEs and large firms),
- making this information available to SMEs using the existing information networks and services, including services on the Internet.

Joint innovation/SME activities

(i) *European support network for the promotion of research, technology transfer and innovation*

Objectives

The aim is to rationalise and coordinate the networks providing information and assistance concerning the Community's research and innovation activities, so as to provide an effective overall framework for information, assistance, cooperation and innovation-promotion, aimed particularly at SMEs and making full use of the existing networks of IRCs and CRAFT contact points.

The aim is further to increase firms' receptiveness to technologies capable of helping them to improve their innovative capacity, to encourage transnational transfers of technologies, whatever their origin, to promote the dissemination and exploitation of the results of Community research, and to inform and assist potential participants in such research activities.

Activities

- promotion of technology transfer reflecting the needs of the local economic, industrial and social fabric,
- establishment of means of cooperation and transnational partnerships between firms,
- support for the dissemination and exploitation of the results of Community research activities, for example by organising 'technology fairs',
- promotion of innovation through experimental networks and services,
- assistance to guide firms' participation in the programmes and help them put together transnational projects.

(ii) *Electronic information services and other means of dissemination*

Objectives

The aim is to group together and encourage the dissemination, in the context of a joint information service, of all the data needed to publicise more effectively research and innovation activities, the procedures for carrying them out, and their results with a view to furthering their exploitation; to inform the general public, including the social partners, about the socioeconomic impact of innovation policies, and fuel the debate about the issues at stake where these policies are concerned, given the needs of individuals.

Activities

- consolidation of the Cordis Community information service by reorganising the information gathering and circulation mechanisms including the use of a common format for collecting data on projects and results, improving ease of access (multilingualism, 'users' interface and the identification of results suitable for exploitation in other contexts), adapting the content to the needs of SMEs and their support networks and developing tailor-made tools,
- possible extension of the ERGO (European research gateway on-line) pilot scheme by establishing a link between Cordis and the national scientific and technical information sources.

(iii) *Intellectual property*

Objectives

The aim is, first of all via information and where appropriate via pilot activities, to encourage the use of knowledge-protection systems, for the purposes either of effective protection or of information-gathering (research results, market trends, search for industrial alliances, etc.) and to facilitate access to the various sources of information about intellectual and industrial property. Another objective is to protect the knowledge in the possession of the Community (JRC) and to provide assistance to framework programme participants.

Activities

- Contribution to the establishment of an information system giving access to the various sources of information about patents, other intellectual property rights, the legislation in force and the interpretation thereof,
- creation of a help-desk for participants in Community programmes,
- activities concerning the protection and utilisation of research results belonging to the Community, in liaison with the JRC,

- carrying-out of pilot activities to encourage actual or potential participants to take advantage of the patent system, in collaboration with the European Patents Office and the national offices.

(iv) *Access to private innovation financing*

Objectives

The aim is to provide SMEs, and in particular SMEs participating in Community research activities, or exploiting the results thereof, with information and advice about the opportunities for access to private innovation-financing instruments (financial markets, venture capital) and to promote cooperation between financial sources, researchers and industry.

Activities

- development of an information and assistance service to facilitate access to sources of private financing,
- implementation, in the context of the thematic programmes or with the assistance of the innovation-support networks, of *ad hoc* awareness-raising, incentive and training schemes, notably on the management of risk, and organisation of transnational investment forums bringing together entrepreneurs, researchers, and financial operators, and including the LIFT (links to innovation financing for technology) activities,
- exchanges of experience with the players concerned in the Member States, the European Investment Fund (EIF), other financial operators and establishment of transnational networks involving private and public operators on specific projects, and carrying-out of pilot activities to try out new approaches (e.g. technology assessment, mobilisation of local capital, benchmarking of performances); these pilot activities will not provide financial subsidies to enterprises or create competing financial instruments,
- facilitating the establishment of contacts with financial sources with a view to the exploitation of the results of Community research.

(v) *Mechanisms to facilitate the setting-up and development of innovative firms*

Objectives

The aim is, in accordance with the guidelines of the Amsterdam European Council, to analyse, identify and validate, in the context of pilot activities, new approaches to support for the setting-up and development of innovative firms, and to encourage private investment (in particular venture capital)⁽¹⁾ in such firms. These pilot activities will not provide financial subsidies to enterprises or create competing financial instruments.

Activities

- study and analysis of obstacles to the private financing of innovation and measures to create an environment favourable to the setting up and development of innovative firms,
- targeting of private financing on the early stages of innovative high-tech projects, and firms with a substantial growth potential, in particular via initiatives based on the experience acquired with the I-TEC pilot project (innovation and equity capital) in cooperation with the European Investment Fund (EIF), the European Investment Bank (EIB) and other financial operators,
- assistance for fund managers (and in particular managers of venture capital funds) to acquire lasting expertise in the evaluation and management of this type of project.

⁽¹⁾ Commission communication 'Risk capital, a key to job creation in the European Union' ; SEC(98)552 final.

*ANNEX III***SPECIFIC RULES FOR IMPLEMENTING THE PROGRAMME**

The specific programme will be implemented through indirect RTD actions as provided for in Annexes II and IV to the fifth framework programme. In addition, the following rules specific to this programme will apply:

1. Accompanying measures

The accompanying measures will comprise in particular:

- studies in support of the specific programme, including the preparation of future activities and the innovation trend chart,
- the exchange of information, conferences, seminars, workshops and scientific and technical meetings on topics related to activities under the programmes,
- mechanisms to facilitate the protection of knowledge, and access to private financing methods,
- recourse to external expertise, including access to scientific databases, in particular for the purposes of the monitoring of the specific programme provided for in Article 5(1) of the fifth framework programme, the external assessment provided for in Article 5(2) of the fifth framework programme and the evaluation of indirect RTD actions and the monitoring of their implementation,
- dissemination, information and communication activities, including scientific publications, and activities for the exploitation of results and the transfer of technologies,
- training schemes related to RTD activities covered by the specific programme, other than Marie Curie fellowships,
- support for schemes to provide information and assistance for research players, including SMEs,
- recourse to external capacities of the establishment of and access to services and networks for information, assistance and promotion of research and innovation.

2. Pilot activities

The pilot activities will be carried out in the areas indicated in Annex II to this Decision. They will be aimed at trying out new measures which require specific implementing arrangements, on account of their nature, their context and the categories of players that they involve. In accordance with Article 9(3) of the rules for participation and dissemination, these arrangements may depart from the procedures generally applicable to indirect RTD actions, on condition that they provide for evaluation and selection procedures respecting the principles of equity and transparency.

3. Coordination arrangements

The Commission will endeavour to ensure complementarity between the indirect RTD actions under the programme, in particular by grouping them around a common objective, and to avoid duplication, while respecting the legitimate interests of proposers of indirect RTD actions.

As far as possible, coordination will also be ensured between actions under the specific programme and those carried out in:

- other specific programmes implementing the fifth framework programme,
- the research and training programmes implementing Council Decision 1999/64/Euratom of 22 December 1998 concerning the fifth framework programme of the European Atomic Energy Community (Euratom) for research and training activities (1998 to 2002)⁽¹⁾,
- other European research frameworks including Eureka and COST,
- other Community research-related instruments.

It will comprise:

- (i) the identification of common themes or priorities, resulting in particular in:
 - the exchange of information,
 - the carrying out of work decided on jointly, entailing in particular the joint initiation of one of the procedures referred to in Article 9 of the rules for participation and dissemination,
 - the examination of the lessons learned from carrying out this work and the evaluation of their economic and social impact;
- (ii) the reassignment of proposals for indirect RTD actions between specific programmes or between a specific programme and a research and training programme.

⁽¹⁾ OJ L 26, 1.2.1999, p. 34.

COUNCIL DECISION

of 25 January 1999

adopting a specific programme for research, technological development and demonstration on improving the human research potential and the socioeconomic knowledge base (1998 to 2002)

(1999/173/EC)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 130i(4) thereof,

Having regard to the proposal from the Commission⁽¹⁾,

Having regard to the opinion of the European Parliament⁽²⁾,

Having regard to the opinion of the Economic and Social Committee⁽³⁾,

(1) Whereas by Decision No 182/1999/EC⁽⁴⁾, the European Parliament and the Council adopted the fifth framework programme of the European Community (hereinafter referred to as the fifth framework programme) for research, technological development and demonstration (hereinafter referred to as RTD) activities for the period 1998 to 2002 setting out the general outlines and scientific and technological objectives of the activities to be carried out in the field of improving the human research potential and the socioeconomic knowledge base;

(2) Whereas Article 130i(3) of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity under the framework programme, and that each specific programme shall define the detailed rules for implementing it, fix its duration and provide for the means deemed necessary;

(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⁾ and Article 4(2) of the Council Decisions on the specific programmes implementing the fourth framework programme, the Commission has arranged for an external assessment to be conducted which it has transmitted to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions together with its conclusions and comments;

(4) Whereas, in accordance with Article 130j of the Treaty, Council Decision 1999/65/EC of 22 December 1998 concerning the rules for the participation of undertakings, research centres and universities and for the dissemination of research results for the implementation of the fifth framework programme of the European Community (1998 to 2002)⁽⁶⁾ (hereinafter referred to as 'the rules for participation and dissemination') applies to this specific programme; whereas these rules allow the participation of the Joint Research Centre in the indirect actions covered by this specific programme;

(5) Whereas, for the purpose of implementing this programme, in addition to cooperation covered by the Agreement on the European Economic Area or by an Association Agreement, it may be appropriate to engage in international cooperation activities, in particular on the basis of Article 130m of the Treaty, with third countries or international organisations;

(6) Whereas implementation of this programme will also comprise activities and mechanisms aimed at stimulating, disseminating and exploiting RTD results, in particular *vis-à-vis* small and medium-sized enterprises (SMEs);

⁽¹⁾ OJ C 260, 18.8.1998, p. 87.

⁽²⁾ Opinion delivered on 15 December 1998 (not yet published in the Official Journal).

⁽³⁾ OJ C 407, 28.12.1998, p. 123.

⁽⁴⁾ OJ L 26, 1.2.1999, p. 1.

⁽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).

⁽⁶⁾ OJ L 26, 1.2.1999, p. 46.

- (7) Whereas it is important that the scientific, industrial and user communities should contribute substantially to the definition of activities to be undertaken and should be involved, as appropriate, in the implementation of this programme;
- (8) Whereas research activities under the fifth framework programme should also be geared towards innovation in order to contribute, *inter alia*, to the objectives of the first action plan for innovation;
- (9) Whereas the improvement of human potential is an essential factor in the enhancement of competitiveness, innovation and employment in the Community;
- (10) Whereas special emphasis should be placed on encouraging the participation of SMEs;
- (11) Whereas the equal opportunities policy of the Community must be taken into account in the implementation of the programme;
- (12) Whereas efficient and transparent management contributes to a more effective and user-friendly programme;
- (13) Whereas administrative expenditure should be included in the Community budget in a transparent fashion;
- (14) Whereas the implementation of this programme should be monitored with a view to adapting it, where appropriate, to scientific and technological developments; whereas in due course there should also be an assessment of progress with the programme by independent experts;
- (15) Whereas the Scientific and Technical Research Committee has been consulted on the scientific and technological content of the specific programmes,

HAS ADOPTED THIS DECISION:

Article 1

In accordance with Article 3(1) of the fifth framework programme, the specific programme on improving the human research potential and the socioeconomic

knowledge base (hereinafter referred to as the specific programme) is hereby adopted for the period from 25 January 1999 to 31 December 2002.

Article 2

1. In accordance with Annex III to the fifth framework programme, the amount deemed necessary for carrying out the specific programme is EUR 1 280 million, including a maximum of 6,55 % for the Commission's administrative expenditure.

An indicative breakdown of this amount is given in Annex I.

2. Of the amount in paragraph 1:

— EUR 293 million is for the period 1998 to 1999,

and

— EUR 987 million is for the period 2000 to 2002.

In the case referred to in Article 2(1)(c) of the fifth framework programme, the Council shall adapt the latter figure in accordance with Article 2(1)(c), second indent of the fifth framework programme. Pending a decision by the Council, this specific programme shall not be implemented beyond the provision of the first indent.

3. The budgetary authority shall, in compliance with the scientific and technological objectives and priorities laid down in this Decision, set the appropriations for each financial year taking into account the availability of resources within the multiannual financial perspective.

Article 3

1. The general outlines, the scientific and technological objectives and the priorities for the specific programme are set out in Annex II. They are consistent with the principles and the three categories of selection criteria indicated in Annex I to the fifth framework programme.

2. In accordance with these principles and criteria the selection criteria indicated in Article 10 of the rules for participation and dissemination shall be applied for the selection of the RTD activities to be carried out.

Selection criteria specific to this programme are given in Annex IV.

All these criteria shall be complied with in the implementation of the programme, including the work programme referred to in Article 5(1), although they may be weighted differently.

3. The rules for participation and dissemination shall apply to the specific programme.

4. The detailed rules for financial participation by the Community in the specific programme are those referred to in Article 4 of the fifth framework programme.

The indirect RTD actions under the specific programme are defined in Annexes II and IV to the fifth framework programme.

Specific rules for implementing the programme are set out in Annex III to this Decision.

Article 4

In the light of the criteria referred to in Article 3, and the scientific and technological objectives and priorities set out in Annex II, the Commission:

- (a) shall monitor, with appropriate assistance from independent external experts, the implementation of the specific programme and, where appropriate, submit proposals to the Council for adapting it, in accordance with Article 5(1) of the fifth framework programme;
- (b) shall arrange for the external assessment provided for in Article 5(2) of the fifth framework programme to be conducted concerning the activities carried out in the fields covered by the specific programme.

Article 5

1. The Commission shall draw up a work programme specifying:

- (a) in greater detail, the objectives and RTD priorities of Annex II;

(b) the indicative timetable for the implementation of the specific programme;

(c) the coordination arrangements set out in Annex III and arrangements to secure the objectives, related to innovation and the participation of SMEs, of the third activity of the fifth framework programme;

(d) where necessary, the selection criteria and the arrangements for applying them for each type of indirect RTD action.

2. The work programme shall take account of relevant interests, in particular the scientific, industrial and user communities. It shall serve as a basis for implementing the indirect RTD actions according to the procedures set out in the rules for participation and dissemination.

3. The work programme shall be updated where appropriate and be made available by the Commission to all interested parties in a user-friendly form, including in electronic form.

Article 6

1. The Commission shall be responsible for the implementation of this specific programme.

2. The procedure laid down in Article 7 shall apply for the adoption of the following measures:

- the drawing-up and updating of the work programme referred to in Article 5(1), including regarding the content of calls for proposals,
- approval of RTD actions proposed for funding, including participation by entities from third countries, where the estimated amount of the Community contribution under this programme is equal to or more than EUR 0,3 million,
- the drawing-up of the terms of reference for the external assessment provided for in Article 5(2) of the fifth framework programme,
- any adjustment to the indicative breakdown of the amount as set out in Annex I.

Article 7

1. The Commission shall be assisted by a programme committee (hereinafter referred to as 'the

committee') composed of representatives of the Member States and chaired by the representative of the Commission.

2. In the cases referred to in Article 6(2), the representative of the Commission shall submit to the committee a draft of measures to be taken. The committee shall deliver its opinion on the draft measures referred to above within a time limit which the Chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148(2) of the Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The Chairman shall not vote.

3(a) The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee.

(b) If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority.

If, on expiry of a period of nine weeks from the referral of the matter to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

4. The Commission shall regularly inform the committee of the overall progress of the

implementation of the specific programme, and shall in particular provide it with information about the progress of all RTD actions funded under this programme.

5. The committee will be supported by a subcommittee composed of representatives from Member States. Its task will be to provide expert advice both on the implementation of socioeconomic research in this programme as well as to provide an overview of socioeconomic research across the whole of the framework programme.

Article 8

In accordance with Article 5(4) of the fifth framework programme, the Commission shall regularly inform the Council and the European Parliament of the overall progress of the implementation of the programme, including on the participation of SMEs and the simplification of administrative procedures.

Article 9

This Decision is addressed to the Member States.

Done at Brussels, 25 January 1999.

For the Council
The President
J. FISCHER

ANNEX I

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

<i>(million EUR)</i>	
Type of activity	Amount
— Supporting training and mobility of researchers	858
— Enhancing access to research infrastructures	182
— Promoting scientific and technological excellence	50
— Key action: improving the socioeconomic knowledge base	165
— Support for the development of scientific and technology policies in Europe	25
Total	1 280

ANNEX II

THE GENERAL OUTLINES, THE SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES AND THE PRIORITIES

INTRODUCTION

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 quality of life of its citizens.

GENERAL OBJECTIVES

The general objectives of this programme, to be realised in concert with related activities elsewhere in the framework programme, are centred on two main areas of activity, to improve the human research potential and to strengthen 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 action, 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.

1. ACTIONS SPECIFIC TO THE PROGRAMME

A. Improving human research potential

(i) Supporting training and mobility of researchers

The individual and collective expertise of the Community's researchers is a considerable asset. However, scientific research takes place in a strongly competitive worldwide environment and compared with our main competitors, the Community has a relative shortage of researchers; a rather high fragmentation and duplication of research effort; a certain isolation of research teams, particularly in the peripheral and less-favoured regions of the Community; a relatively low mobility of researchers, both geographically and between academia and industry; a general tendency towards an ageing workforce, which also affects the research field; and underuse of the potential of female scientists.

To address these issues, 'Supporting training and mobility of researchers' will concentrate on helping to create a European research area through the following overall objectives: stimulating training through research of young researchers, especially those in the early stages of their professional career; promoting equality of opportunities between women and men in the research field; promoting transnational cooperation between research teams, including interdisciplinary approaches, particularly through networking around a common research project; promoting the mobility of researchers throughout Europe; encouraging cooperation, interactions and staff mobility between academic and industrial research; and promoting the scientific and technological cohesion of the Community, particularly with respect to its less-favoured regions.

This action of the programme will be implemented through two lines: research training networks and a coherent system of Marie Curie fellowships. They will be open to all fields of scientific research that contribute to the Community's objectives in research, technological development and demonstration, for projects chosen freely by the participants themselves. In the selection of projects, there will be no pre-established target in terms of scientific discipline or topic — the selection being made on the criteria of scientific excellence and relevance to the objectives of the actions alone (i.e. a bottom-up approach). However, there will be an (*ex-post*) assessment of project allocation in relation to research areas and participation by men and women.

Research training networks

The primary objective is to promote training through research, especially of young researchers at pre-doctoral and at post-doctoral level, within the frame of high-quality transnational collaborative research projects, including those in emerging fields of research. Community support will be awarded both to reinforce the research teams of a network through the temporary appointment of young researchers coming from a country other than that of the team concerned and to contribute towards the costs of coordinating the collaborative research project on which the network is based.

Each network will be required to define an appropriate training programme for its young researchers. Its training programme will take advantage of the international nature of the network and, when relevant, the multidisciplinary nature of its joint project, the complementarity of its teams and the network's connections with industry. Research training networks will promote the training of researchers in an industrially relevant environment as well as encourage interplay between academic and industrial research, where these features are relevant to the networks training programme. All networks will be required to offer equal opportunities to male and female researchers.

System of Marie Curie fellowships

This line consists 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. This system is a focused attempt at a more efficient use of Community funding of fellowships for training through research.

The researchers participating are of three categories: (i) postgraduates; (ii) young researchers with the necessary research experience; these are typically researchers with a doctoral degree or at least four years of full-time research experience at postgraduate level other than doctoral studies; (iii) experienced researchers; these are typically researchers with at least 10 years of research experience at post-doctoral level and who are established staff members of a research institution. This action will provide equal opportunities for men and women.

Marie Curie individual fellowships

The scheme will provide advanced training through research for the best of Europe's young researchers with a view to these fellows becoming Europe's leading researchers. The research institutions will host young researchers with the necessary research experience.

In addition, after completion of a two-year individual fellowship, fellows originating from a less-favoured region and who wish to return to a less-favoured region in their country of nationality may receive a return fellowship.

Additional and complementary schemes include:

Marie Curie industry host fellowships

The scheme will provide young researchers with opportunities to carry out research in industrial or commercial environments. The aim is also to stimulate cooperation between industry and academia. The industrial and commercial enterprises will host postgraduates and young researchers with the necessary research experience. The host will be expected to provide adequate research facilities and supervision arrangements for the fellow. There will be special measures for SMEs in order to stimulate the participation of these enterprises in the scheme.

Marie Curie development host fellowships

The scheme will help develop high-level research capacity in research institutions in the less-favoured regions of the Community. Research institutions established in less-favoured regions with a need to develop new areas of competence will host young researchers with the necessary research experience. By this means the scientific and technological cohesion of the Community will be enhanced.

Marie Curie experienced researchers fellowships

This scheme will harness the expertise of Europe's experienced researchers for the transfer of knowledge and technology between industry and academia (in both directions) and for similar transfer to the less-favoured regions. The experienced researcher will come from an industrial or commercial enterprise and go to a university or research centre, or vice versa; or will come from, or go to a research institution in a less-favoured region.

Stays at Marie Curie training sites

The scheme will provide young researchers pursuing their doctoral studies with the possibility to undertake part of them at a Marie Curie training site, and by this means optimising the use of specialist training sites in order to create Community added-value.

(ii) Enhancing access to research infrastructures

Access to major research infrastructures is increasingly indispensable for researchers working at the forefront of science. The ability of European research teams to remain competitive with teams elsewhere in the world depends on their being supported by such state-of-the-art infrastructures.

The term 'research infrastructures' refers to facilities and establishments that provide essential services to the research community. It covers, for example, singular large-scale research installations, collections, special habitats, libraries, databases, integrated arrays of small research installations, as well as infrastructural centres of competence which provide a service for the wider research community based on an assembly of techniques and know-how.

As most of the major research infrastructures in Europe are operated by national authorities principally for the benefit of their national researchers, access to these infrastructures is often restricted largely or even entirely to national research teams.

The result is that researchers do not always have the opportunity to access the infrastructures in Europe most appropriate for their work. In addition, some scarce state-of-the-art facilities owned by industrial companies tend to be closed to researchers working outside the company.

Another feature of Europe's research infrastructures is the relatively low level of transnational cooperation that exists between infrastructure operators in many fields. A strong Community added-value would arise if the same culture of cooperation could be created among infrastructure operators as is now beginning to exist between Europe's researchers.

In the context that the construction and operation of infrastructures is the responsibility of national authorities, 'Enhancing access to research infrastructures' has the following general objectives:

- to sponsor new opportunities for transnational access to major research infrastructures of Community-wide interest,
- to stimulate infrastructure operators and users to work together in order to make more effective use of research infrastructures and hence to improve the service they provide to the scientific community,
- to arrange coordinating, supporting and accompanying actions that ensure consistency with related actions undertaken in other specific programmes.

It will be open to infrastructures in all fields of scientific research that contribute to the Community's objectives in research, technological development and demonstration, to the extent that such measures are not undertaken by other activities of the framework programme. It will be implemented primarily through an action to help researchers with transnational access to major research infrastructures. In addition, there will be two complementary actions — infrastructure cooperation networks and research infrastructure RTD projects.

Transnational access to major research infrastructures

The objective is to sponsor new opportunities for research teams (including individual researchers) to obtain access to the major research infrastructures most appropriate for their work, irrespective of where in the Member States or Associated States they or the infrastructure is located.

To be considered for Community support, the infrastructure must provide a world-class service essential for the conduct of top quality research, must be rare in Europe, must have investment or operating costs that are relatively high in relation to those costs in its particular field, and must provide adequate scientific, technical and logistic support to external, particularly first-time, users.

Community support will be awarded to the selected infrastructure operators for them to provide access to their facilities free of charge to transnational users. Each selected infrastructure operator will be expected to publicise widely the opportunities being offered and to arrange for an independent peer-review of proposals submitted to it based on scientific merit, where in addition priority is to be given to first-time users and to users coming from countries where no similar facility exists.

As a general rule, users conducting proprietary research will not be supported under this action. An exception will, however, be made in the case of SMEs which wish to use a particular infrastructure for the first time.

Infrastructure cooperation networks

The objective is to catalyse the self-coordination and the pooling of resources between infrastructure operators in order to foster a culture of cooperation between them, to generate critical mass for research into higher performance techniques, instrumentation and technologies, to spread good practice, to promote common protocols and interoperability, to encourage complementarity and to stimulate the creation of 'distributed' and 'virtual' large facilities.

Community support will be awarded to help coordinate those joint activities that could lead to the more effective use and exploitation of present and future infrastructures relevant to the network. Participants in these networks will be operators of research infrastructures, research teams in universities, in research centres and in industry, representatives of users of the infrastructures, and equipment manufacturers. Each network will be devoted to different aspects of Europe's research infrastructures.

Research infrastructure RTD projects

The objective is to support cooperative research efforts that could have widespread significance at a Community level for enhancing access to and improving the service provided by infrastructures in a

particular field. Such RTD projects will be particularly encouraged when they are in support of the work of the infrastructure cooperation networks of this programme or of the precursor concerted actions of the earlier training and mobility of researchers' programme.

(iii) Promoting scientific and technological excellence

Scientific and technological excellence are essential prerequisites for Europe to succeed in the competitive environment of international research and scientific development. The promotion of excellence would be expected to encourage the best individuals and teams to become involved in and be committed to European research and to increase the visibility of outstanding research findings produced by European researchers.

At the same time it will be important to improve the public understanding of science and research in society with the objective of creating a favourable environment for research and technological development, and in particular for activities carried out under Community framework programmes. Scientific activities and research can only succeed and have the expected beneficial impact if citizens develop a basic understanding of science and scientific issues and come to an overall positive perception of relevant activities and their results.

Where possible, activities will build on and complement national activities.

High-level scientific conferences

High-level scientific conferences will contribute to the advancement of science through exchange and to create conditions for experienced researchers, working at the cutting edge of scientific and technological development, to impart their knowledge and experience to the younger generation. Scientific conferences will also create the framework for the networking of Community researchers active outside the Community to build up or preserve their contacts and scientific relations with colleagues in Europe.

Scientific conferences may be organised as Euro-conferences, Euro-courses, Euro-workshops or Euro-summer schools. They will, as a general rule, be small-scale events. Bigger events may be supported with the objective of facilitating the participation of young researchers. Non-traditional forms of scientific conferencing such as electronic conferences will be encouraged. Scientific conferences will be open to all fields of scientific research on topics freely chosen by the researchers themselves.

Distinctions for high-level research work

These distinctions will give public recognition and visibility to researchers having successfully completed outstanding scientific or technological results from European collaborative research. Distinctions for younger people who have carried out remarkable scientific work while still in the secondary or tertiary educational system will motivate them to continue their efforts in the interest of Europe's scientific and technological future and also encourage other individuals of the same age to take an active interest in science and research.

Distinctions will be foreseen as follows: the Descartes Prize for outstanding scientific and technological achievements resulting from European collaborative research; an award to undergraduate students of higher education institutions in Europe having developed original scientific ideas or concepts in areas which are relevant to the advancement of European science; the European Union Contest for Young Scientists, catering for scientific talents in the age range 15 to 20 years, to be organised in conjunction with the appropriate 'public awareness' activities.

Raising public awareness

The main objective will be to raise public awareness for scientific activities and technological developments, in particular those undertaken in European research programmes, and thereby bridge the gap between science in its European dimension and the public. This should help European citizens

to better understand both the beneficial impact of science and technology on their day-to-day lives as well as limitations and possible implications of research and technological developments. The activity will also aim to increase scientists' awareness of issues and subjects that are of concern to the public.

Community support will be provided: to promote European networking and the exchange of best practice between successful projects and initiatives at national or regional level; to arrange for regular encounters between scientists and science communicators; to promote the participation of women in science; to support the organisation of a European Science and Technology Week as a showcase for the concerted and coordinated display of European efforts in science and research; to provide, via electronic networks and other appropriate means, information on topical scientific and technological subjects in a language that is understandable to the scientifically interested but non-specialist citizen.

B. Key action: improving the socioeconomic knowledge base

The European Union draws its strength both from the social and cultural diversities between its members as well as from the similarities of their experiences and common values. The Community also has a solid tradition of research in social and economic science and the humanities, which need 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 quality of life of its citizens.

In a period of increasing challenges, such as unacceptable levels of unemployment, an ageing population, the globalisation of economies, an increase in inequalities, and a declining relative contribution to the world economy, European society will have to undergo changes towards achieving sustainable socioeconomic development, the improvement of the quality of life of all its citizens and to maintain and enhance Europe's competitive position in the world. Social sciences must therefore be in a position to respond to these challenges, overcome national boundaries, through reinforcing cooperation between them and enhancing their analytical capacity and thereby supporting policy-making. Furthermore the process of European integration itself has given rise to a new object of study, European society, which is different from the sum of its components, although clearly dependent on them.

The objective of this key action will be to improve our understanding of the structural changes taking place in the European society in order to identify ways of managing change and to involve European citizens more actively in shaping their own futures. This will involve the analysis of the main trends giving rise to these changes, the analysis of the relationships between technology, employment and society, the impact of new technologies on working conditions, the reappraisal of participation mechanisms for collective action at all levels of governance and the elaboration of new development strategies fostering growth of employment and economic and social cohesion.

This key action covers a number of subjects linked to the general objectives of the framework programme and aims at defining the base for employment-generating social, economic and cultural development and for building a European knowledge society. These subjects should not be seen in isolation, but as interrelated parts of a coherent and comprehensive framework.

Support will aim at developing a conceptual understanding of the processes described above, built on empirical, comparative and prospective research, including constructing and integrating data and indicator systems and establishing a common research infrastructure. These activities will therefore contribute to provide the policy decision-making process with a sound knowledge of the challenges facing Europe, of their main consequences and of possible policy options to tackle them.

Societal trends and structural changes

Against a background of profound structural, demographic and social changes, research within this theme will aim at elucidating the complex interactions between societal trends, life chances, changes in family structures, economic changes, labour-market institutions, cultural patterns and value systems, taking into account European regional diversities. The analysis will include the phenomena of xenophobia, racism and migration. Attention will be accorded on the impact on economic development, social integration, social protection and factors of social inequalities and discrimination.

The study of these interactions will provide a better understanding of the changing patterns of work and organisation of time, of the use of new types of atypical and part-time or temporary jobs, of the capacity of education and training to prepare individuals over their lifetime to a changing environment and to enhance knowledge of the gender issue in European society. Research work will provide a sound knowledge base and contribute to the formulation and development of the relevant European policies.

Technology, society and employment

Research under this theme aims to understand better the relationship of interdependency and embeddedness between technology and society and to contribute to an integrated approach to planning and development. While the need for integrating social, institutional and environmental concerns in the technological development process is now accepted, the possible options vary according to different kinds of technologies, the state of their development and diffusion in society. Research will be undertaken on methods of interaction between the various actors concerned — suppliers, users, advisory bodies, decision-makers and public authorities. An improved understanding of the deployment and the impact of technologies in various socioeconomic, territorial, institutional, political and cultural contexts in the Union is expected to arise from this work. Research will also examine the role of the public sector in the innovation process and how authorities interact with other partners.

Attention will be paid to the relationships between technology and employment, in particular the new information and communications technologies and the new ways of organising production and labour, including newly emerging professions, the geographical location of employment, changes in the working conditions and in the workforce skills. The role of innovation in education and training, the concept of lifelong learning, as well as how education and training can stimulate innovation, promote employment, social integration and equal opportunities, will also be examined.

Governance and citizenship

In the context of European integration, there is a need to reassess the role of the different levels of governance in Europe (local, regional, national and supranational). The aim will be to analyse the mutual articulation of responsibility and accountability at all levels and their real capacity as agents of change, while allowing for the development of mechanisms of dialogue, deliberation and decision-making to ensure effective cooperation between all the actors concerned.

Research will set out to explain to what extent the various types of economic and social regulation in Europe are the consequences of a specific socio-institutional and cultural construction, in order to define better European integration strategies. It will address both regulation by public authorities as well as civil initiatives and structures such as political parties, public interest groups and social partners. The examination of the role of public authorities will also cover the reassessment of their missions, and of the concept of public service and the notion of public interest. In this framework, the analysis of the evolution of welfare systems will be a key element. In these analyses of governance, the notion of political, economic and social power will also be taken into account.

The analyses will be accompanied by the study of the concept of citizenship across Europe, and of types and systems of participation of citizens and regulation to which they give rise. Research will also analyse the influence of the various components of culture (traditions, language, history, heritage, religions, migrations) and of educational models on the development of values. Analysis at the level of the individual could complement, where appropriate, research in this area. The role of media in a global economy, in which international audiovisual cultural products are increasingly present, will also be examined. The analyses will examine the interrelationships between governance and citizenship.

New development models fostering growth and employment

This prospective work will seek to explore new sustainable development models to foster growth, job creation, equal opportunities, the reduction of inequalities and the improvement of quality of life. It will investigate the dynamics of creation and distribution of wealth and the role of the public sector in this context in a globalised economy where intangible and service factors predominate. This will involve the development of indicators and methodologies for assessing the social and economic added-value of the various production models, identifying competitiveness factors including human capital, and characterising the different policies best adapted to the European economic area, taking into account Europe's regional divergencies, and to the evolution of Europe in the world economic relations.

Research will concentrate on analyses of issues such as organisational innovations, new types of work and employment, including the working potential of older population, the responses to the increasing demand for services, the development of non-profit mutual supporting activities, and innovations in socioeconomic partners' cooperation. Socioeconomic and demographic differences across Europe and the impact of the development models on economic and social cohesion will be included in the analysis.

C. Support for the development of scientific and technology policies in Europe

To fulfil the tasks conferred on it by the Treaty in the field of research and innovation, the European Union needs to increase its ability to anticipate the issues at stake for Europe in the field of science and technology by exploiting the resources available to it in this area more effectively.

A considerable amount of research work and studies are carried out and indicators produced ahead of the framing of science and technology policy at national and European level. The inadequate interaction between very diverse national approaches, and the complexity and often transnational dimension of the issues addressed by the work in question call for networking and the collation and coordinated exploitation of results at European level in order to shed light on certain major issues in good time.

In order to support the development of the specific base of knowledge about scientific and technology policy issues which is needed by both national and European decision-makers and other users, these activities provide a flexible, strategic intelligence-gathering, collating and evaluation service. By underpinning and complementing the activities carried out at national and international level, the activities are intended to promote the exchange of information and experience between decision-makers and researchers and enable knowledge to be put to better use.

Strategic analysis of specific political issues

This activity involves the provision of support for the analytical and collating work to be carried out on a limited number of specific issues relating to scientific and technology policy. This work will be carried out by groups of experts from specialised national and international organisations and include studies, seminars and conferences. They will also provide policy-makers with a source of scientific advice. The matters to be dealt with will be identified by decision-makers and other players concerned with science and technology policies in the following fields:

- matters relating to the implications, for science and technology policies, of the challenges posed by scientific and technological change, globalisation, changes in social demands, the new forms of competition and cooperation between businesses, and job-creation and growth in a manner that is environmentally sound and contributes to social cohesion,
- matters relating to how the objectives and priorities of these policies and the instruments used to implement them enable them to be tackled and analysis of their socioeconomic impact.

Common basis of science, technology and innovation indicators

The design, coordination and assessment of RTD strategies in Europe require the availability of relevant and comparable indicators at different levels (national, regional, European, world), including indicators measuring progress towards sustainable development. This second type of activity, carried out in conjunction with the Statistical Office and the relevant Commission Services and in cooperation with the specialist institutes in Europe, should gradually establish a common European base of science, technology and innovation indicators.

It will be a question of coordinating and funding the work needed in order to compile appropriate statistics and new indicators covering the Union and the main third countries; it will in this way be possible to make available to the authorities concerned in the Member States, the European and national parliamentary assessment offices, and the Commission Services and all interested parties, a coherent set of data sent electronically and accompanied by the services needed for their processing, analysis and proper use.

2. INTERACTION WITH RELATED ACTIONS IN THE OTHER FRAMEWORK PROGRAMME ACTIVITIES

A major feature of this programme will consist of the coordination and support of relevant activities throughout the framework programme, concerning, in particular, researchers' training, support for research infrastructures and the overall socioeconomic dimension of Community research. The horizontal socioeconomic research dimension within the vertical thematic programmes makes coordination an important factor for the success of the framework programme. More specifically:

- for the Marie Curie fellowships: these could also be implemented by the thematic programmes. In order to ensure consistency, common rules will apply concerning eligibility, implementation modalities, legal and financial provisions, and a single entry point for the reception of proposals will be set up,
 - for major research infrastructures: consistency and complementarity of approach will be ensured with the relevant actions of the other specific programmes,
 - for socioeconomic research: coordination will be achieved through participation in the elaboration of the work programmes, support in the creation of appropriate evaluation mechanisms, in particular through the participation of socioeconomic scientists, and collection and dissemination of relevant information, in order to ensure that the socioeconomic dimension is consistently taken into account in the specific programmes,
 - for the activities in support of the development of science and technology policies in Europe: consistency and complementarity with the actions of the other specific programmes will be ensured through coordination, the use of harmonised instruments (e.g. policy-oriented thematic networks and expert panels) and a common approach for the dissemination of results (e.g. publications, seminars and conferences).
-

ANNEX III

SPECIFIC RULES FOR IMPLEMENTING THE PROGRAMME

The specific programme will be implemented through the indirect RTD actions as provided for in Annexes II and IV of the fifth framework programme. In addition, the following rules specific to this programme will apply:

1. SPECIAL CONDITIONS

Supporting training and mobility of researchers

Research training networks

A research training network will normally consist of at least five mutually independent legal entities from at least three Member States or Associated States.

Community funding will cover up to 100 % of the additional eligible costs connected with the temporary appointment of young researchers, both pre-doctoral and post-doctoral, and with coordinating the joint project on which the network is based. The maximum funding for a network as a whole will correspond to the cost of taking on a young researcher in each of its partners as well as making a contribution to the costs of coordinating the project. At least 60 % of the funding for each network will be attributed to the costs of appointing young researchers.

Community support will normally not be granted to procure durable equipment nor to finance the research work itself.

System of Marie Curie fellowships

Only legal persons established and international organisations located in a Member State or Associated State are eligible to participate as host institutions.

Researchers eligible to participate in the system of Marie Curie fellowships are of three categories, as defined in Annex II to this programme. They must be nationals of a Member State or an Associated State or residing in the Community for at least the last five years⁽¹⁾.

The research will be undertaken in a country other than the one where the research fellow's nationality and most recent centre of activity is located. Exceptions however shall apply, in cases where knowledge and technology will be transferred to the less-favoured regions for:

- individual return fellows,
- experienced researchers, provided that their research be undertaken in a country other than the one in which the experienced researcher is an established member of a research institution.

Marie Curie individual fellowships

The application for an individual fellowship will be made by the fellow in conjunction with the host institution. The fellows will be selected by the Commission on the basis of the criteria stipulated in Annex IV of the present programme.

The fellowships will be paid to the host institution in accordance with Annex IV to the fifth framework programme. The amount of the allowance for the fellow will be established for each Member State and Associated State taking into account both the high standard of the Marie Curie

⁽¹⁾ Applicants for Marie Curie fellowships should ensure that they are able to fulfil the immigration and visa requirements for the Member State or Associated State in which they intend to undertake their fellowship.

fellows and the overall situation of researchers of a corresponding level in the host country; it will include a provision for proper social security expenses.

Each host must ensure that the fellow is covered under the social security scheme which is applied to employed workers within the Member State or Associated State concerned, or under a social security scheme providing a protection which is at least comparable, in terms of level and scope.

Marie Curie industry host fellowships

The host institutions will be selected by the Commission on the basis of the criteria stipulated in Annex IV to the present programme. The fellows will subsequently be selected by the host institution. The Commission will establish detailed criteria, concerning notably qualification and equal access opportunities to be followed by the industry host in the selection of fellows. Before a fellowship contract is offered, the selected fellows will have to be confirmed by the Commission.

A joint funding from the Community and the host institution will enable the host institution to finance postgraduates and young researchers with the necessary research experience.

Marie Curie development host fellowships

The host institutions will be selected by the Commission on the basis of the criteria stipulated in Annex IV to the present programme. The fellows will subsequently be selected by the host institution. The Commission will establish detailed criteria, concerning notably qualification and equal access opportunities to be followed by the host in the selection of fellows. Before a fellowship contract is offered, the selected fellows will have to be confirmed by the Commission.

Community funding will enable the host institution to finance young researchers with the necessary research experience.

Marie Curie experienced researchers' fellowships

The application for an experienced researcher fellowship will be made by the fellow in conjunction with the host institution. The experienced researchers will be selected by the Commission on the basis of the criteria stipulated in Annex IV to the present programme.

Community funding will enable the host institution to finance an experienced researcher.

Stays at Marie Curie training sites

A training site is a clearly identifiable part of a research organisation, such as a research group or interrelated research groups. The training site must be internationally recognised within its respective field and have proven experience in doctoral training, particularly the training of postgraduate students from abroad. In addition, organisers of international doctoral studies, in the framework of a formal collaboration between participating organisations in different countries having the form of certain common requirements for achieving the doctoral degree, are considered possible training sites.

The training sites will be selected by the Commission on the basis of the criteria stipulated in Annex IV to the present programme. The young researchers will subsequently be selected by the training site. The Commission will establish detailed criteria, concerning notably qualification and equal access opportunities to be followed by the training site in the selection of fellows. Before a fellowship contract is offered, the selected fellows will have to be confirmed by the Commission.

The young researchers must be pursuing doctoral studies in a country other than that of the host institution in a subject area similar to that of the training site. They must undertake the period of training at the training site as an integral part of their doctoral studies.

Community funding will enable the training site to finance short stays for the young researchers of a maximum duration of an academic year.

Enhancing access to research infrastructures

Transnational access to major research infrastructures

Participants in this line will be legal entities which operate major research infrastructure. International organisations operating major research infrastructure in the Member States or Associated States may exceptionally participate with financing from the programme provided that the access being financed by the programme is both complementary to the mission of the organisation concerned and not eligible for support from the organisation's own financial resources.

Community funding is intended to cover 100 % of the travel and subsistence costs of visits to the infrastructure by teams of researchers working in Member States and Associated States other than the State where the owner and operator of the facility is located. Community funding will also cover up to 100 % of the additional eligible costs of providing teams of researchers with access to the infrastructure; such costs will be calculated either on the basis of a unit user-fee to be negotiated with each infrastructure operator and to be derived from its direct operating costs, or on the basis of the actual additional costs connected with making the facility available to the visiting teams of researchers. Eligible costs will exclude all contributions to capital costs.

Infrastructure cooperation networks

Infrastructure cooperation networks will be implemented as thematic networks. Each network will contain at least three mutually independent legal entities which operate research infrastructure from at least three different countries of the Member States and Associated States and will be coordinated by a legal entity which operates a research infrastructure.

Research infrastructure RTD projects

RTD projects will contain at least two mutually independent legal entities which operate research infrastructure in at least two countries of the Member States and Associated States. The project will be coordinated by a legal entity which operates a research infrastructure.

Concerted actions

The Commission may initiate, in conjunction with legal entities which operate research infrastructure and are contractors under this programme (or under the earlier training and mobility of researchers programme), concerted actions, to encourage the exchange of information between infrastructure operators and researchers from Member States or Associated States on subjects of common interest, complementing national and international efforts.

Promoting scientific and technological excellence

High-level scientific conferences

Participants in this line will be legal entities from all fields of scientific endeavour who wish to organise a scientific conference, involving researchers from a cross-section of the respective scientific community.

Community funding is intended to contribute to organisational costs, to the participation of speakers or teaching staff and to cover up to 100 % of expenses related to the participation of young researchers in the selected event. Support will also be made available to facilitate the participation of researchers who are nationals of one of the Member States and Associated States and who at the time of the event are active in laboratories or institutions outside Member States or Associated States.

Distinctions for high-level research work

Participants in the Descartes Prize will be researchers who have obtained outstanding scientific or technological results from European collaborative research.

Participants in the award for undergraduate students of higher education institutions and in the European Union Contest for Young Scientists will be legal entities, organising corresponding procedures at national level and young people whose projects have been selected in that frame.

Community funding will cover up to 100 % of costs related to the preparation and organisation of appropriate selection procedures, including the awarding of monetary prizes or equivalent recognition to the most deserving projects.

2. ACCOMPANYING MEASURES

The accompanying measures will comprise in particular:

- studies in support of the specific programme including the preparation of future activities, including on strategic issues arising in the course of the programme,
- exchanges of information, conferences, seminars, workshops, round tables, study panels,
- recourse to external expertise in particular for the purposes of the monitoring of the specific programme provided for in Article 5(1) of the fifth framework programme, the external assessment of the actions provided for in Article 5(2) of the fifth framework programme, the evaluation of indirect RTD actions and the monitoring of their implementation,
- dissemination, information and communication activities, including scientific publications and activities for the promotion and exploitation of results and the transfer of technology,
- the promotion of the identity and prestige of Marie Curie fellows, especially through the Marie Curie Fellowship Association,
- support in order to bring together potential participants for the purpose of elaborating a detailed work plan for a research proposal, in particular as a means of stimulating proposals in newly emerging fields of science and technology or in novel transdisciplinary approaches, or in fields where there is little history of transnational cooperation,
- support for schemes to provide information and assistance to research players, including SMEs.

3. COORDINATION ARRANGEMENTS

The Commission will endeavour to ensure complementarity between the indirect RTD actions under the programme, in particular by grouping them around a common objective, and to avoid duplication, while respecting the legitimate interests of proposers of indirect RTD actions.

As far as possible, coordination will also be ensured between actions under the specific programme and those carried out in:

- other specific programmes implementing the fifth framework programme,
- the research and training programmes implementing Council Decision 1999/64/Euratom of 22 December 1998 concerning the fifth framework programme of the European Atomic Energy Community (Euratom) for research and training activities (1998 to 2002)⁽¹⁾,
- other European research frameworks including Eureka and COST,

⁽¹⁾ OJ L 26, 1.2.1999, p. 34.

-
- other Community research-related instruments such as PHARE, TACIS, MEDA, the EIF, the Structural Funds, the EIB and programmes in the field of education, training and youth.

It will comprise:

- (i) the identification of common themes or priorities, resulting in particular in:
 - the exchange of information,
 - the carrying out of work decided on jointly, entailing in particular the joint initiation of one of the procedures referred to in Article 9 of the rules for participation and dissemination;
 - (ii) the reassignment of proposals for indirect RTD actions between specific programmes or between a specific programme and a research and training programme.
-

ANNEX IV

SELECTION CRITERIA FOR THE IMPLEMENTATION OF THE PROGRAMME

The specific selection criteria for certain parts of this programme, which supplement those referred to in Article 3, are the following:

Supporting the training and mobility of researchers*Research training networks*

Networks will be selected on the basis of the scientific merit of the collaborative research project on which the network is based and the quality and content of the network's training programme. Networks promoting interactions between different disciplines and those containing complementary teams as well as those involving meaningful connections with industry will be preferred over networks of otherwise equal merit, where these features are relevant to the network's training programme.

*System of Marie Curie fellowships***Marie Curie individual fellowships**

The selection criteria will include the research experience and the aptitude of the candidate, the impact and benefit of the training for the candidate, the research quality of the hosting research group, the ability of the host to meet the specific research training needs of the candidate, and the scientific and technological quality and relevance of the project.

For return fellowships, the selection criteria will include the results and research experience gained by the candidate during the initial fellowship, and the benefit to the new hosting research group.

Marie Curie industry host fellowships

The host institutions will be selected by the Commission. The fellows will subsequently be selected by the host institution. The Commission will establish detailed criteria, concerning notably qualification and equal access opportunities, to be followed by the industry host in the selection of fellows. Before a fellowship contract is offered, the selected fellows will have to be confirmed by the Commission.

The selection criteria will include the research quality of the host, the ability to provide adequate training, supervision arrangements and research facilities for the fellow, collaborative arrangements with other research organisations, and the scientific and technological quality and relevance of the proposed research area.

The fellows will be selected by the host on the basis of their scientific ability and on the compatibility of their research experience with the proposed research area.

Marie Curie development host fellowships

The host institutions will be selected by the Commission. The fellows will subsequently be selected by the host institution. The Commission will establish detailed criteria, concerning notably qualification and equal access opportunities to be followed by the development host in the selection of fellows. Before a fellowship contract is offered, the selected fellows will have to be confirmed by the Commission.

The selection criteria will include the relevance and impact of the competence which is sought, the compatibility of the new competence with the existing competence of the host, the appropriate size of the hosting research group in order to allow adequate working conditions for the fellows, and the international nature of the research activities of the hosting research group.

The fellows will be selected by the host on the basis of their scientific ability and on the compatibility of their research experience with the needs of the host.

Marie Curie experienced researchers' fellowships

The selection criteria will include the scientific excellence of the candidate, the scientific and technological quality and relevance of the project, and the relevance, impact and benefit of the fellowship for the parties involved.

Stays at Marie Curie training sites

The training sites will be selected by the Commission. The young researchers will subsequently be selected by the training site. The Commission will establish detailed criteria, concerning notably qualification and equal access opportunities to be followed by the training site in the selection of fellows. Before a fellowship contract is offered, the selected fellows will have to be confirmed by the Commission.

The selection criteria will include the research quality of the training site, the ability of the training site to provide research training, the evidence of past successful international doctoral training, and the appropriate size of the training site in order to allow adequate working conditions for the young researchers.

The young researchers will be selected by the training site on the basis of their scientific ability and on the suitability of the training site for their particular doctoral studies.

Enhancing access to research infrastructures

Transnational access to major research infrastructures

The criteria for selecting infrastructure to be supported will be the quality of the infrastructure, the quality of the research that external users are able to conduct there, the quality of the scientific, technical and logistic support provided for these external users, the scale of interest being demonstrated by new transnational users coming from countries where no similar infrastructure exists, and the cost-effectiveness of Community support.

Infrastructure cooperation networks

Infrastructure cooperation networks will be selected on the basis of their potential to enhance the access to and the service provided by research infrastructures that have a Community-wide interest and on the basis of the ability of the participants to provide an effective coordination of the network's activities.

Research infrastructure RTD projects

RTD projects will be selected on the basis of the scientific originality of the project, the quality of its research method and work plan, the potential of the project to improve infrastructure provision in Europe, and the degree of interest shown generally by infrastructure operators in the field and by the user community.

Promoting scientific and technological excellence

High-level scientific conferences

The criteria for the selection of scientific meetings to be supported will be the interest of the proposed topic for a wider scientific community, the quality of the proposed conference programme and its relevance for the training of the younger generation of European researchers.

Distinctions for high-level research work

Distinctions will be awarded on the basis of the scientific quality and the relevance of presented projects. Age and scientific background of participants will be duly taken into consideration.

Raising public awareness

To qualify for Community support, projects need to address an issue of broader European interest and involve high quality interaction between scientists and science communicators for the benefit of European citizens. Preference will be given to projects and initiatives involving at least three mutually independent partners from at least three different Member States or Associated States. Other projects may qualify for support if they promise to produce transferable results that could be used by actors not involved in the respective project.

COUNCIL DECISION

of 25 January 1999

adopting a specific programme for research and technological development, including demonstration, to be carried out by means of direct actions for the European Community (1998 to 2002) by the Joint Research Centre

(1999/174/EC)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 130i(4) thereof,

Having regard to the proposal from the Commission⁽¹⁾,

Having regard to the opinion of the European Parliament⁽²⁾,

Having regard to the opinion of the Economic and Social Committee⁽³⁾,

(1) Whereas by Decision No 182/1999/EC⁽⁴⁾, the European Parliament and the Council adopted the fifth framework programme of the European Community (hereinafter referred to as the fifth framework programme) for research, technological development and demonstration (hereinafter referred to as RTD) activities for the period 1998 to 2002 setting out the general outlines and scientific and technological objectives of the activities to be carried out by the Joint Research Centre (JRC) for the European Community;

(2) Whereas Article 130i(3) of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity under the framework programme, and that each specific programme shall define the detailed rules for implementing it, fix its duration and provide for the means deemed necessary;

(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⁾ and Article 7(3) of the Council Decision on the specific programmes implementing the direct actions of the fourth framework programme, the Commission has arranged for an external assessment to be conducted which it has transmitted to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions together with its conclusions and comments;

(4) Whereas, in accordance with Article 130j of the Treaty, Council Decision 1999/65/EC of 22 December 1998 concerning the rules for the participation of undertakings, research centres and universities and for the dissemination of research results for the implementation of the fifth framework programme of the European Community (1998 to 2002)⁽⁶⁾ (hereinafter referred to as 'the rules for participation and dissemination') applies to this specific programme as regards dissemination of research results; whereas these rules allow the participation of the Joint Research Centre in the indirect actions covered by this specific programme;

(5) Whereas, for the purpose of implementing this programme, in addition to cooperation covered by the Agreement on the European Economic Area or by an Association Agreement, it may be appropriate to engage in international cooperation activities, in particular on the basis of Article 130m of the Treaty, with third countries or international organisations;

(6) Whereas implementation of this programme will also comprise activities and mechanisms aimed at stimulating, disseminating and exploiting RTD results, in particular *vis-à-vis* small and medium-sized enterprises (SMEs), and activities to stimulate the mobility and training of researchers;

⁽¹⁾ OJ C 260, 18.8.1998, p. 105.

⁽²⁾ Opinion delivered on 15 December 1998 (not yet published in the Official Journal).

⁽³⁾ OJ C 407, 28.12.1998, p. 123.

⁽⁴⁾ OJ L 26, 1.2.1999, p. 1.

⁽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).

⁽⁶⁾ OJ L 26, 1.2.1999, p. 46.

- (7) Whereas research activities under the fifth framework programme should also be geared towards innovation in order to contribute, *inter alia*, to the objectives of the first action plan for innovation; whereas the JRC should actively pursue activities in innovation and technology transfer;
- (8) Whereas the equal opportunities policy of the Community must be taken into account in the implementation of this programme;
- (9) Whereas the implementation of this programme should be monitored with a view to adapting it, where appropriate, to scientific and technological developments and needs; whereas in due course there should also be an assessment of progress with the programme by independent experts;
- (10) Whereas, in the implementation of this programme, the Board of Governors of the JRC is consulted by the Commission in accordance with the relevant provisions of the Commission Decision concerning the organisation of the JRC; whereas the current provisions are set out in Commission Decision 96/282/Euratom⁽¹⁾;
- (11) Whereas the Board of Governors of the JRC has been consulted on the scientific and technological content of this specific programme,

An indicative breakdown of this amount is given in Annex I.

2. Of the amount in paragraph 1:

— EUR 189 million is for the period 1998 to 1999,

and

— EUR 550 million is for the period 2000 to 2002.

In the case referred to in Article 2(1)(c) of the fifth framework programme, the Council shall adapt the latter figure in accordance with Article 2(1)(c), second indent of the fifth framework programme. Pending a decision by the Council, this specific programme shall not be implemented beyond the provision of the first indent.

3. The budgetary authority shall, in compliance with the scientific and technological objectives and priorities laid down in this Decision, set the appropriations for each financial year taking into account the availability of resources within the multiannual financial perspective.

Article 3

HAS ADOPTED THIS DECISION:

Article 1

In accordance with Article 3(1) of the fifth framework programme, a specific programme related to direct actions of research and technological development, including demonstration, to be carried out by the JRC (hereinafter referred to as the specific programme) is hereby adopted for the period from 25 January 1999 to 31 December 2002.

Article 2

1. The amount deemed necessary for the execution of direct actions by the JRC under this programme is EUR 739 million.

1. The general outlines, the scientific and technological objectives and the priorities for the specific programme are set out in Annex II. They are consistent with the principles and the three categories of selection criteria indicated in Annex I to the fifth framework programme.

2. The rules for dissemination of results shall apply to this specific programme.

3. The detailed rules for financial participation by the Community in the specific programme are those referred to in Article 4 of the fifth framework programme.

Direct RTD actions are defined in Annexes II and IV to the fifth framework programme.

Specific rules for implementing the programme are set out in Annex III to this Decision.

⁽¹⁾ OJ L 107, 30.4.1996, p. 12.

Article 4

In the light of the criteria referred to in Article 3(1), and the scientific and technological objectives and priorities set out in Annex II, the Commission:

- (a) shall monitor, with appropriate assistance from independent external experts, the implementation of the specific programme and, where appropriate, submit proposals to the Council for adapting it, in accordance with Article 5(1) of the fifth framework programme;
- (b) shall arrange for the external assessment provided for in Article 5(2) of the fifth framework programme to be conducted concerning the activities carried out in the fields covered by the specific programme.

Article 5

1. The Commission shall draw up a work programme specifying:

- (a) in greater detail, the objectives and RTD priorities of Annex II;
- (b) the indicative timetable for the implementation of the specific programme.

2. The work programme shall be updated where appropriate and be made available by the Commission to all interested parties in a user-friendly form, including in electronic form.

Article 6

1. The Commission shall be responsible for the implementation of this specific programme, carried out by the JRC.

2. The Board of Governors of the JRC (hereinafter referred to as the Board of Governors) shall be consulted by the Commission in this task, in accordance with the relevant provisions concerning the organisation of the JRC.

3. The Commission shall regularly inform the Board of Governors of the implementation of this specific programme.

Article 7

The Commission may request the JRC to execute, on the basis of the criterion of mutual benefit, projects with legal entities established in third countries when this contributes effectively to the execution of direct actions.

Article 8

In accordance with Article 5(4) of the fifth framework programme, the Commission shall regularly inform the Council and the European Parliament of the overall progress of the implementation of the programme.

Article 9

This Decision is addressed to the Member States.

Done at Brussels, 25 January 1999.

For the Council
The President
J. FISCHER

ANNEX I

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

<i>(million EUR)</i>	
Type of activity	Amount
Serving the citizen	292
Enhancing sustainability	321
Underpinning European competitiveness	126
Total	739 ⁽¹⁾ ⁽²⁾

⁽¹⁾ Of which approximately 6 % may be allocated to exploratory research.

⁽²⁾ This total includes the JRC's budget contribution necessary for its participation in shared-cost actions.

ANNEX II

THE GENERAL OUTLINES, SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES AND PRIORITIES

A. THE MISSION OF JRC

The mission of JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of Community policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Community. Close to the policy-making process, it serves the common interest of the Member States, while being independent of commercial or national interests.

Carrying out specific high-level research in close contact with industry and other bodies, the JRC supports the policy-maker in addressing the concerns of the individual citizen, improving the interaction between man and the environment and promoting sustainable development.

In implementing its mission, the JRC will endeavour to coordinate RTD activities carried out in the Member States. Its work depends on intensive networking with public and private institutions in the Member States through, for example, research networks, joint projects or staff exchanges. This is important because the JRC's mission is complementary to the indirect action part of the fifth framework programme; while the indirect actions will continue to be the main mechanism for developing and testing new ideas, the JRC's role is to help apply them in the service of the policy-maker.

B. OBJECTIVE: SUPPORT THE MANAGEMENT OF CHANGE

Progress in technology, especially in the life sciences and information technology, is changing the way we live, the way we do business and the world we live in. These changes are complex and interrelated so those involved with policy need support in understanding how to harness the technologies to provide better services to the citizen, to allow industry to take advantage of new opportunities and to promote policies that protect the citizen from the risks that accompany the benefits of such changes. JRC, as the scientific arm of the Commission, must be able to underpin the management of change by supporting the Community policy-making process through: facilitating a better understanding of emerging issues; providing scientific and technical support to the elaboration and implementation of policies; providing realistic monitoring of the effectiveness of policy measures.

The two selection criteria for JRC activities are:

- relevance to Community policies. An understanding of the policy agenda allows JRC research to be timely and support the formulation of policy where it is most needed,
- subsidiarity. This has two aspects. Firstly the research must be in an area where Community involvement is appropriate and secondly it should be appropriate for this involvement to be through the JRC. Thus JRC operates in areas such as cross-border issues, consumer protection and anti-fraud where its unique pan-European identity provides an added-value.

C. THE JRC PROGRAMME

JRC's specific programme for the fifth framework programme reflects the large changes that have taken place in Europe and the wider world in the past 10 years. While these changes have all been beneficial for growth and prosperity, care is needed to ensure that the growth continues, that European industry can compete on a fair basis within the internal market and on the wider world market, that the growth is sustainable and that Europe's citizens can live in a clean and safe environment.

Accordingly JRC's programme has been divided into three main themes:

- I. Serving the citizen
- II. Enhancing sustainability
- III. Underpinning European competitiveness

The objective of the first theme is to provide support to policy that protects individual citizens. This includes measures to give the consumer confidence that the food he or she eats or buys is identified and labelled correctly, that he or she is protected against fraud, that he or she can fully utilise the benefits of modern medicine, that the information that he or she receives is dependable and that he or she is protected against natural and man-made hazards.

The second main theme is sustainability; achieving growth while protecting the environment, conserving natural resources, maintaining biodiversity and ensuring that the Community can continue funding the relevant policies and avoiding that efforts in these regards are not undermined by fraud. It is a major Community policy objective that environmental considerations be integrated into all other policies and framing legislation that achieves this integration while maintaining a broad free market policy is a major challenge to legislators. JRC will support sustainability through analysis of the environmental impact of policy options, through support to anti-fraud measures in the agriculture and fishery policies, through support to the international effort to prevent global change and through the study of how European ecosystems are changing and could be preserved.

The main objective of the third theme is to contribute to the Community's industrial competitiveness policy by supporting the transfer of knowledge and research results from the scientific community to industrial users. The JRC will for example exploit its specific expertise to facilitate the utilisation of the latest technologies by emerging industries, such as earth observation and advanced materials (e.g. biomaterials). Other appropriate actions will be taken to support key policy areas such as enlargement and integration of candidate countries into a common internal market, pre-accession and EU-Mediterranean cooperation, where further efforts are required to optimise potential synergies between the scientific and industrial communities of the EU and its partner countries.

Two horizontal elements run through all three JRC research themes. The first of these, measurements, standards and testing, constitutes one of the key specialities of the JRC. The second is a techno-economic intelligence that can provide EU institutions with timely advice concerning the development of new technologies, the likelihood of breakthroughs, the social challenges that they pose and their possible impact on policy. This includes monitoring developments in the other major industrialised trading blocs to determine what lessons can be learned. Both these tasks are generic to all JRC activities — even where not explicitly mentioned.

Finally the programme which follows should not to be considered a rigid blueprint for the work programme of JRC over the next four years but rather a general outline that reflects the current view of the policy agenda and its priorities. Changes to the JRC programme are to be expected as science and technology advance and as the policy agenda and the priorities of the customer change.

I. SERVING THE CITIZEN

The first theme of JRC's research is centred on the citizen. The objective is to support those Community policies that are intended to protect him or her, provide him or her with information, maintain his or her health and protect his or her safety.

Consumer policy and consumer health protection are most important factors in Community policy and, in fact, the legal basis for consumer protection will be further strengthened by the Amsterdam Treaty. The main objectives of the policy are to protect the consumer in the internal market; to reinforce market transparency; to improve consumer confidence, especially by more complete and

effective information and education; develop a system of dialogue and consultation between the European Commission and organisations representing consumers, and improve the dialogue between the latter and industry; and to ensure that the interests of the consumer are given due consideration in the development of other Community policies. The JRC will provide scientific support for this policy.

Along with biotechnology, information technology is the fastest moving technology and the EC's information society initiative, while recognising that progress is driven by market forces, ensures that policy fully takes advantages of the benefits of the technology and that individuals can depend on information that has been processed securely. The JRC will support the initiative through technical advice on dependable services and improving the ease of access to information.

The third thrust of the JRC's effort in services to the citizens is in health. The objective here is to exploit specific technologies where the JRC has unique technologies and expertise for the diagnosis and treatment of disease.

Beside safety of food and feed products, Community measures to protect the safety of citizens include, among others, car safety legislation, directives on industrial safety and construction guidelines. The JRC will provide a technical backup to these measures, determine how new technologies can help cope with natural disasters with a cross-border dimension, such as flooding, and contribute to the Union effort on civilian de-mining through appropriate coordination and support activities.

I.1. Consumer protection

For consumer health EC institutions manage scientific committees whose work is based on excellence, independence and transparency; carry out inspections to ensure that rules of hygiene and food safety are respected; and evaluate and assess possible risks to consumer health.

This marked strengthening of consumer policy has been prompted by the general desire to match, on the one hand, the rapid growth in the possibilities offered by advanced technologies to increase the variety and lower the costs of products in the market by, on the other hand, adequate measures to protect consumers. It is clear that a strong scientific support to this policy is required, both to understand the complex issues involved and to apply the latest technology for checking the quality and origins of products. The JRC will support Community policy in this area by applying emerging technologies for consumer protection measures and will be ready to assess and react to new hazards as they occur. This work will involve:

- research to underpin the harmonisation and validation of methods for quality and safety analysis of feeding stuffs, including possible European harmonisation of standards for organic foods, and for animal feedstuffs, food, beverages, and consumer products; provision of references for the determination of food and beverages authenticity and origin, for the establishment of inspection practices and for risk-assessment; methods and references in support of food-labelling and development of anti-fraud techniques,
- support to the implementation of Community policy on biotechnology including methods for the monitoring and detection of genetically modified organisms and risk-assessment studies,
- toxicological studies on the impact and health effects of diverse food contaminants, toxic chemicals (e.g. endocrine disrupters) and pathogenic micro-organisms; establishment of models and procedures for risk-assessment,
- validation of safe alternative procedures to *in-vivo* experiments currently used to determine the toxicological hazards posed by chemicals, pharmaceuticals and consumer products.

I.2. Medical and health applications

Several JRC generated technologies related to nuclear engineering, metrology, informatics and material sciences have potential applications in the area of medicine and healthcare and are sufficiently mature for further development. The implementation of this work will rely on the use of JRC facilities and unique expertise, and will continue to be carried out in networks together with the medical and pharmaceutical communities. It will include:

- active support, including validation and standardisation, to development of anti-cancer therapies based on nuclear technologies, applications of boron neutron capture therapies and alpha-immuno therapies and to medical imaging,
- prenormative research and validation of testing methods for bio-compatible materials and bio-mechanical components; qualification of certain medical equipment for the harmonisation of norms and standards; development, production and certification of reference materials for clinical diagnostics and validation of testing instruments,
- support to telematics systems for the secure exchange of regulatory information on pharmaceuticals in the EC.

I.3. Benefiting from the information society

The JRC's information technology expertise will be used to support dependability aspects of the EC's information society initiative and to strengthen fraud control measures. The work includes:

- support to the dependability initiative including defined tests and tools of reliability, research on systems' survivability, dependability characterisation of services and qualification procedures for embedded systems; application and demonstration of emerging networking technologies, decision support systems and medical data systems; use of research results in statistical and geographic information applications,
- support to anti-fraud measures including the development and operation of effective, reliable and safe communication systems amongst public authorities in Member States and the Commission, development of an early-warning system and methods for analysis and control of large quantities of information from different sources.

I.4. Safety of the citizen: man-made hazards and natural hazards

The EC has a number of measures to protect individuals against hazards. These include standards in car construction, high pressure equipment, obligations on the labelling and notification of dangerous chemicals and the notification of accidents. The JRC plays an active part in the implementation of these policies and in support for the development of new safety measures:

- support of Community industrial safety regulations through analysis of industrial accident data, supply of information to the competent authorities and industry and technical advice to the Commission,
- design, development, validation and harmonisation of inspection procedures for high pressure equipment, with a view to provide maximum safety at the work place; support to the development and implementation of new standards. Interactions of hydrogen with structural materials and preparation of industrial safety norms and standards,
- monitoring, control and management of chemical products: implementation and improvement of regulations for the notification, authorisation, classification and labelling of new and existing chemicals; research on environmental risk-assessment,

- maintenance and further development of a research platform contributing to the scientific and technical basis needed for civilian land de-mining operations; compilation of an index of mine types and their signatures; development of strategies for examining mine fields and establishing secure detection and destruction methods; establishment of reference criteria and standards and validation of clearing methods and available devices,
- chemical characterisation and tools for the determination of the origin of illicit drugs,
- characterisation of the structural safety of transport vehicles and crash barriers; calibration of test facilities in the Member States together with the validation of simulation methods intended to complement traditional impact tests,
- support to the establishment of a common European reporting system for in-flight incidents including analysis of the influence of human error,
- support to the formulation and development of construction standards (Eurocodes); research to ensure safety and reliability of buildings and civil engineering structures against seismic movements, rapid impacts and traffic vibrations including applications for the preservation of significant monuments for the European cultural heritage, assessment of their degradation and techniques for their restoration,
- applications of earth observation techniques for the risk and damage assessment, monitoring and post-crisis management of natural hazards such as forest fires, floods, landslides, droughts, and coastal storms.

II. ENHANCING SUSTAINABILITY

Technological development, sustainable growth, respect and care for the environment are key issues for the Community, enshrined in the Treaty and pursued through common policies and actions.

The Community's fifth environmental action programme (1992 to 2000) forms the basis of environment policy of the EC and describes the challenge of the 1990s as making progress towards sustainable development. A recently published action plan identifies five priority areas where Community action needs to be stepped up. These are firstly improved integration of the environment into other policies such as agriculture, transport, energy, industry and tourism; secondly the use of a wider range of instruments, especially market based instruments but also structural policy, to implement Community policy; thirdly improving the implementation and enforcement of Community legislation; fourthly a raising of public awareness; and lastly a raising of the Union's profile in international affairs — strengthening cooperation with central and east European countries and the Mediterranean partnership countries, enhancing the EU's role in international environmental actions and dealing with trade and environmental issues.

The JRC's scientific and technical services will provide the expertise necessary to help in the understanding of the issues involved and to support the implementation of all five points of the action plan. Its broad range of disciplines will contribute to the establishment of sound and feasible limits for pollutants, the production of commonly accepted reference materials and measurements for monitoring them, the determination of the impact of proposed legislation, the identification of the best available technologies and the assessment of available scientific knowledge for improving industrial processes and reduce pollution, the understanding of global climate change processes and their impact, the identification of new technologies that could affect sustainability. Particular efforts will be made in the energy and transport sectors.

The JRC research aimed at enhancing sustainability will provide support to the Commission, the European Parliament, the Member States and relevant EU agencies, and will include the following targeted issues.

II.1. Integration of environmental protection in other Community policies

The Commission is obliged by the Treaty to assess the consequences of any proposal that has an impact on the environment and to endeavour to integrate sustainability objectives into all sectoral policies such as agriculture, energy, transport and regional development. The JRC will support this effort through:

- socio- and techno-economic studies to improve the integration of environmental protection in sectoral Community policies, including case studies and development of methods to measure and analyse regulatory instruments (e.g. 'green accounting'),
- research on land cover and land use dynamics, regional and urban development trends; research on agro-environmental issues mainly using earth observation; coastal zone management, development and harmonisation of indicators of environmental degradation.

II.2. Pollution

Community legislation requires that new industrial developments use the best available techniques in order to reduce pollution in an integrated manner, i.e., to take account of all forms of pollution, air, soil and water. As a support to this and all other pollution control management measures it is a prerequisite that systems be developed for detecting pollutants and that measurements throughout the Community be harmonised. The JRC's work will therefore involve:

- support to environmental legislation for integrated (e.g. water, air, soil) pollution prevention and control in industry; development of the reference framework for the use of best available techniques in several industrial sectors; assessment of the impact of legislation on competitiveness and employment,
- support to the international harmonisation of pollution-monitoring techniques; development and production of reference materials and measurements in different materials (e.g. soil, water, air, biota, etc.) for pollution control,
- research to underpin the harmonisation and validation of reference methods for the analysis of water quality, water monitoring, water treatment and water management; assessment of toxicological risks posed by water pollutants; interventions in emergency cases; procedures and criteria for water quality control; studies on water management practices and their impacts in geographical areas protected by EC legislation and in those prone to flooding and drought,
- development of techniques for localisation of soil contamination due to industrial activities and to monitor marine pollution events (e.g. algae blooms, oil spills) including the detection of vessels causing pollution,
- research to underpin harmonisation and validation of air quality control methods and criteria for air quality in urban and 'conurban' areas; impact of alternative fuels on air quality and emissions of micro-particles; surveillance of radioactivity in the environment; regional programmes for environmental monitoring of selected regions (e.g. the Alpine Convention).

II.3. Global change

By signing the Kyoto Protocol, industrialised nations have committed themselves to reducing greenhouse gas emissions. The European Union, which negotiated on behalf of the Member States, has promised to reduce emissions to 8% below 1990 levels. The European Union needs strong technical support in order to maintain credibility as a party to the Climate Convention, strengthen its position

on the international scene, understand possible futures for Europe including implications for managed and unmanaged natural resources, public health and biodiversity, highlight risks and uncertainties and formulate appropriate policy. The JRC will support Community policy by:

- study on the fluxes of greenhouse gases and aerosols; research on the processes leading to greenhouse emissions; assessment of the consequences of the Kyoto Protocol on emission levels, air quality, climatic change and the European economy; support to European political initiatives,
- exploitation of Earth observation for mapping, monitoring and making an inventory of key global, marine and terrestrial resources. Global information systems and models will support the analysis and understanding of observed trends. Access to global datasets will be provided to European research networks.

II.4. Energy and transport

The final consumption of energy in Europe is divided almost equally between industry (29 %), transport (32 %) and the household and tertiary sectors (39 %). The majority of this is from fossil fuel with petroleum products dominating the transport sector and almost two thirds of all coal being used for the production of electricity. Only by effective measures to reduce emissions and replace fossil fuels with renewable energies can Europe respect international agreements and achieve sustainable growth. The 1996 Green Paper on renewable energy found that the EC Treaty offered ample scope for promoting renewable energy and suggested that the Community reinforce its policy in order to achieve a target 12 % of gross inland energy consumption by 2010. The JRC will support Community policy through:

- integration of renewable energies in energy systems and related socioeconomic studies; development of new testing techniques and proposals for the preparation of norms and standards for photovoltaic and solar thermal systems, the new generation of energy-storage systems, fuel cells and insulating and other energy-efficient materials and devices; study of hydrogen as a fuel with particular regard to safety issues and analysis of techno-economic aspects,
- contribution to the development and harmonisation of testing methods, inspection procedures, norms and standards for materials and components used in high-efficiency power generation systems and high temperature systems. Particular attention will be paid to the enhancement of the safety and operational lifetime and the reduction of emissions,
- research on the interaction between neutrons and materials; provision of neutron reference data for energy production in the framework of international conventions. Related techno-economic studies and high-level training as support to industry, with particular attention to partners in enlargement and pre-accession countries,
- development and validation of new emission control and reduction technologies for land, air and sea transport systems; analysis of data concerning various emission-reduction technologies and creation of a reference laboratory for coordination of round-robin experiments and networks; execution of cost-benefit studies and techno-economical modelling, and development of the technical standards base,
- appropriate studies to assess demand evolution for urban and regional transport systems in support of Community transport policy.

II.5. Agriculture, rural development and fisheries

Community policy is to make agriculture more competitive in world markets and to give new priority to sustainable rural development, consumer-friendly products and more environmentally sensitive practices. It should prepare for the enlargement to the East which means a 50% increase of agricultural land and a doubling of the farm labour force. Fraud control is important because of the size of the budget involved and because of health concerns in the case of agriculture, and because of sustainability concerns in the case of fisheries. JRC will continue to play an active role in supporting policy through:

- prospective techno-economic studies and scenarios to support better understanding of long-term trends of policies related to the food chain and to regional development policies. Emphasis will be on the contribution of science and technology to these central Community policies and will consider the wider political context (e.g. enlargement, Mediterranean policy),
- studies on the evolution of the rural environment; earth observation monitoring of changes in rural and coastal areas (environmental impacts, forest development and management, trends in agriculture and aquaculture, tourism); coastal zone management,
- development and assessment of methods for the surveillance of regulated activities in the fisheries sector,
- development of agro-meteorological models for the prediction of crop yields (particularly with a view to EU enlargement); monitoring of results to ensure consistency with priorities of the common agricultural policy and anti-fraud measures; harmonisation and quality control of work done in Member States on farmers' declarations; reorientation of the agriculture information system towards priority sectors of agricultural activities; development of advanced statistical methods and sampling strategies to control subsidies at the decisive stage of the clearance of accounts,
- design and operation of a database for registering and monitoring livestock movements throughout the Community; technical support for the implementation of a reliable identification and labelling system for the entire Community herd, including overall quality control and electronic systems certification,
- development and production of certified reference materials and development of reference methods for securing the quality of agricultural products (e.g. nutritional components, trace contaminants in raw materials, etc.).

III. UNDERPINNING EUROPEAN COMPETITIVENESS

The primary contributions of the Community towards economic development, growth and the creation of employment are the promotion of industrial competitiveness and an efficient internal market in all products and services. The Community likewise negotiates trading agreements with third countries that ensure fair access to markets for Community products and stimulate economic growth in developing countries. Economic growth is also the objective of structural funding, including programmes such as PHARE and TACIS, that can help prepare less-favoured regions and countries for fuller integration in the internal market and the global economy.

Fair trading depends on internationally agreed standards and the JRC will continue to support the promotion and development of soundly-based European and international norms, standards, codes of practice and reference tools. Support to structural policy will include the transfer of technology developed in the JRC to industry and measures to stimulate the competitiveness on world markets of emerging industries such as the earth observation industry, where the JRC has specific expertise, and the development of a scientific infrastructure in the Mediterranean partnership countries. These efforts will be backed up by more generic studies to determine how technology is transferred from research to industry and how employment is affected by changing patterns of industry.

III.1. Employment, technology and industrial competitiveness

The issues related to employment and competitiveness will continue to dominate the political debate in Europe in the years to come. The JRC will support this issue through:

- investigation of the technology, employment and competitiveness interrelationship. Identification of best practices to foster growth and employment. Analysis of the influence of societal trends (age, gender, etc.), structural changes in sectors (industry, services, institutions, etc.) technology changes and Community policies (euro, enlargement and deregulation, etc.) on future competitiveness and employment in Europe,
- analysis of factors limiting the development of less-favoured European regions with a view to eliminating bottlenecks and improving competitiveness and employment; prospective analysis of Community research priorities and role of science and technology for regional development.

III.2. Normative support to the international trading system

Industries need predictable and reliable market access conditions before making the considerable investments needed for their penetration. There is also a need for all market operators to refer to well-established, verifiable and internationally accepted measurements, in order to ensure the transparency of market regulations and avoid unfair competition and unnecessary litigation. In pursuance of these objectives, the JRC will undertake:

- the characterisation, production, storage, stability testing and international distribution of Community Bureau of References (CBR) certified reference materials is underpinning many of the activities performed by JRC in support of different policies (environment, consumer protection, health, industrial competitiveness, etc.); production of industrial certified reference materials particularly when urgent intervention is needed or when stocks need to be replaced,
- development and performance of primary isotopic measurements; production of isotopic reference materials and establishment of a virtual institute of primary isotopic measurements with national measurement institutes, for transboundary comparability of chemical measurements, to support accreditation bodies and quality assurance systems and to realise traceability of chemical measurements to common references; support to Member States in building up their own metrology systems,
- development and validation of analytical reference methods for elements and their chemical forms, radionuclides and organic constituents; research on radionuclide metrology for the preparation of primary standards, equipment calibrations and determination of trace elements,
- prenormative research and support to the development of measurement and testing standards for materials in emerging technologies such as nanotechnologies.

III.3. Innovation and technology transfer

It is universally acknowledged that innovation drives competitiveness and growth. The JRC will support efforts to understand the processes that control the transfer of knowledge from the research sector to the private sector and take steps to maximise the benefit of its own technology to industry. The work includes:

- studies related to Europe's innovation system aiming at improving the exploitation of Europe's scientific and technological potential. Particular attention will be given to the identification of best methods and practices for the creation, transfer and trading of knowledge, organisation of enterprises, educational and training requirements and the specific needs of SMEs, developing the interface of JRC networks with the enterprise policy's networks,
- support to the development of a competitive and sustainable value-added earth observation industry in Europe by identification of new users, development of new products and services and development of tools support customers of earth observation data, information and services,
- exploitation of JRC results; studies to understand users' needs; selection of innovation and technology transfer projects for JRC-developed technologies; demonstrations to users and potential investors. Priority will be given to collaboration with high-technology SMEs.

III.4. Enlargement, pre-accession and international cooperation

The increased technology flows under the globalisation of markets, the current European Union external policy objectives and the need for efficient protection of the financial interest of the EC, call for strengthening dialogue and cooperation on science and technology issues with future partner countries. The JRC will support the enlargement process by sharing its knowledge with scientists from future Member States, hosting their scientists and encouraging them to use its facilities and join its networks. In particular, the JRC:

- will promote the association to international measurements evaluation programmes of relevant organisations in candidate countries to European Union enlargement and in other third countries; extension to industries and research institutions in these countries of the networks for advanced materials and standards,
 - will develop the cooperation with southern and eastern Mediterranean partnership countries with a view to exchanging best practices, scientific knowledge and produce techno-economic input to the objectives of the Barcelona process,
 - will develop a multidisciplinary database of harmonised and coherent geographical data for an enlarged European Union. The JRC will provide the necessary technical coordination and will foster the development of standards for software and methods aiming at the complete interoperability of geographic information systems.
-

ANNEX III

SPECIFIC RULES FOR IMPLEMENTING THE PROGRAMME

1. The Commission, after consulting the Board of Governors of the JRC, shall implement the direct actions on the basis of the scientific objectives and contents described in Annex II. The activities relating to this action shall be performed in the relevant institutes of the Joint Research Centre (JRC).
2. In the implementation of its activities, the JRC will, whenever appropriate and feasible, participate in or organise networks of public and private laboratories in the Member States or European research consortia. Particular attention shall be paid to cooperation with industry, especially with small and medium-sized enterprises. Research bodies established in third countries may also cooperate on projects of scientific and technological cooperation between the Community and the third countries concerned. Particular attention will be paid to cooperation with research laboratories and institutes in the countries of central and eastern Europe and the former Soviet Union.

The knowledge gained through implementation of the projects will be disseminated by the JRC itself (taking into account possible limitations due to confidentiality issues).

3. The accompanying measures shall include:
 - the organisation of visits to JRC institutes of grant-holders, visiting scientists and seconded experts,
 - organisation of the secondment of JRC staff to national laboratories, industrial laboratories and universities,
 - specialised training in support of the elaboration or implementation of European policies and specialised training with emphasis on multidisciplinary,
 - systematic exchange of information, through, *inter alia*, the organisation of scientific seminars, workshops and colloquiums and scientific publications,
 - the independent scientific and strategic evaluation of the performance of the projects and programmes.
-

COUNCIL DECISION

of 25 January 1999

adopting a research and training programme (Euratom) in the field of nuclear energy
(1998 to 2002)

(1999/175/Euratom)

THE COUNCIL OF THE EUROPEAN UNION,

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

Having regard to the proposal from the Commission⁽¹⁾,

Having regard to the opinion of the European Parliament⁽²⁾,

Having regard to the opinion of the Economic and Social Committee⁽³⁾,

- (1) Whereas by Decision 1999/64/Euratom⁽⁴⁾, the Council adopted the fifth framework programme of the European Atomic Energy Community (hereinafter referred to as 'the fifth framework programme') for research and training (hereinafter referred to as 'RT') activities for the period 1998 to 2002 setting out the general outlines and scientific and technological objectives of the research and training activities to be carried out in the field of nuclear energy;
- (2) Whereas Article 3 of the fifth framework programme stipulates that the framework programme shall be implemented through specific research and training programmes drawn up in accordance with Article 7 of the Treaty; whereas each programme defines the detailed rules for its implementation, fixes its duration and provides for the means deemed necessary;
- (3) Whereas, in accordance with Article 4(2) of Council Decision 94/268/Euratom of 26 April 1994 concerning the fourth framework programme of Community activities in the field of research and training for the European Atomic Energy Community (1994 to 1998)⁽⁵⁾

and Article 4(2) of the Council Decisions on the specific programmes implementing the fourth framework programme, the Commission has arranged for an external assessment to be conducted which it has transmitted to the European Parliament, the Council and the Economic and Social Committee together with its conclusions and comments;

- (4) Whereas, in accordance with Article 7 of the Treaty, Council Decision 1999/66/Euratom of 22 December 1998 concerning the rules for the participation of undertakings, research centres and universities for the implementation of the fifth framework programme of the European Atomic Energy Community⁽⁶⁾ (hereinafter referred to as 'the rules for participation') applies to this specific programme; whereas these rules allow the participation of the Joint Research Centre in the indirect actions covered by this specific programme;
- (5) Whereas, for the purpose of implementing this programme, it may be appropriate to engage in international cooperation activities, in particular on the basis of Article 101 of the Treaty, with third countries and international organisations;
- (6) Whereas implementation of this programme will also comprise activities and mechanisms aimed at stimulating, disseminating and exploiting RT results, and activities to encourage the mobility and training of researchers;
- (7) Whereas it is important that the scientific, industrial and user communities should contribute substantially to the definition of activities to be undertaken and should be involved, as appropriate, in the implementation of this programme;
- (8) Whereas research activities under the fifth framework programme should also be geared towards innovation in order to contribute, *inter alia*, to the objectives of the first action plan for innovation;

⁽¹⁾ OJ C 236, 28.7.1998, p. 10.

⁽²⁾ Opinion delivered on 15 December 1998 (not yet published in the Official Journal).

⁽³⁾ OJ C 407, 28.12.1998, p. 123.

⁽⁴⁾ OJ L 26, 1.2.1999, p. 34.

⁽⁵⁾ OJ L 115, 6.5.1994, p. 31. Decision as last amended by Decision 96/253/Euratom (OJ L 86, 4.4.1996, p. 72).

⁽⁶⁾ OJ L 26, 1.2.1999, p. 56.

- (9) Whereas implementation of the JET (Joint European Torus) project has been given to the Joint European Torus (JET) joint undertaking set up under Council Decision 78/471/Euratom⁽¹⁾;
- (10) Whereas the equal opportunities policy of the Community must be taken into account in the implementation of this programme;
- (11) Whereas efficient and transparent management contributes to a more effective and user-friendly programme;
- (12) Whereas administrative expenditure should be included in the Community budget in a transparent fashion;
- (13) Whereas the implementation of this programme should be monitored with a view to adapting it, where appropriate, to scientific and technological developments; whereas in due course there should also be an assessment of progress with the programme by independent experts;
- (14) Whereas the Scientific and Technical Committee (STC) has been consulted,

HAS ADOPTED THIS DECISION:

Article 1

In accordance with Article 3(1) of the fifth framework programme, the specific programme on research and training in the field of nuclear energy (hereinafter referred to as the specific programme) is hereby adopted for the period from 25 January 1999 to 31 December 2002.

Article 2

1. In accordance with Article 2 of the fifth framework programme, the amount deemed necessary for carrying out the specific programme is EUR 979 million, including a maximum of 13,5% for the Commission's administrative expenditure.

An indicative breakdown of this amount is given in Annex I.

2. Of the amount in paragraph 1:

— EUR 238,2 million is for the period 1998 to 1999,

and

— EUR 740,8 million is for the period 2000 to 2002.

In the case referred to in Article 2(1)(c) of the fifth framework programme, the Council shall adapt the latter figure in accordance with Article 2(1)(c), second indent of the fifth framework programme. Pending a decision by the Council, this specific programme shall not be implemented beyond the provision of the first indent.

3. The budgetary authority shall, in compliance with the scientific and technological objectives and priorities laid down in this Decision, set the appropriations for each financial year taking into account the availability of resources within the multiannual financial perspective.

Article 3

1. The general outlines, the scientific and technological objectives and the priorities for the specific programme are set out in Annex II. They are consistent with the principles and the three categories of selection criteria indicated in Annex I to the fifth framework programme.

2. In accordance with these principles and criteria the selection criteria indicated in Article 9 of the rules for participation shall be applied for the selection of the RT activities to be carried out.

All these criteria shall be complied with in the implementation of the programme, including the work programme referred to in Article 5(1), although they may be weighted differently.

3. The rules for participation shall apply to the specific programme.

4. The detailed rules for financial participation by the Community in the specific programme are those referred to in Article 4 of the fifth framework programme.

The indirect RT actions under the specific programme are defined in Annex III to the fifth framework programme.

Specific rules for implementing the programme are set out in Annex III to this Decision.

⁽¹⁾ OJ L 151, 7.6.1978, p. 10. Decision as last amended by Decision 98/585/Euratom (OJ L 282, 20.10.1998, p. 65).

Article 4

In the light of the criteria referred to in Article 3, and the scientific and technological objectives and priorities set out in Annex II, the Commission:

- (a) shall monitor, with appropriate assistance from independent external experts, the implementation of the specific programme and, where appropriate, submit proposals to the Council for adapting it, in accordance with Article 5(1) of the fifth framework programme;
- (b) shall arrange for the external assessment provided for in Article 5(2) of the fifth framework programme to be conducted concerning the activities carried out in the fields covered by the specific programme.

Article 5

1. The Commission shall draw up a work programme specifying:

- (a) in greater detail, the objectives and RT priorities of Annex II;
- (b) the indicative timetable for the implementation of the specific programme;
- (c) the coordination arrangements set out in Annex III;
- (d) where necessary, the selection criteria and the arrangements for applying them for each type of indirect RT action.

2. The work programme shall take account of relevant interests, in particular the scientific, industrial and user communities. It shall serve as a basis for implementing the indirect RT actions according to the procedures set out in the rules for participation.

3. The work programme shall be updated where appropriate and be made available by the Commission

to all interested parties in a user-friendly form, including in electronic form.

Article 6

1. The Commission shall be responsible for implementing this specific programme.

2. For the purposes of implementing this programme the Commission shall be assisted by a consultative committee. The members of this committee can vary according to the different subjects on the committee's agenda. For fission-related aspects, the composition of this committee and the detailed operational rules and procedures applicable to it shall be as laid down in Council Decision 84/338/Euratom, ECSC, EEC⁽¹⁾ dealing with management and coordination advisory committees. For the fusion-related aspects they shall be as laid down in the Council Decision of 16 December 1980 dealing with the consultative committee for the fusion programme.

Article 7

In accordance with Article 5(4) of the fifth framework programme, the Commission shall regularly inform the Council and the European Parliament of the overall progress of the implementation of the programme.

Article 8

This Decision is addressed to the Member States.

Done at Brussels, 25 January 1999.

For the Council
The President
J. FISCHER

⁽¹⁾ OJ L 177, 4.7.1984, p. 25.

ANNEX I

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

<i>(million EUR)</i>	
Type of activity	Amount
(a) Key actions	
(i) Controlled thermonuclear fusion	788
(ii) Nuclear fission	142
(b) Research and technological development activities of a generic nature	39
(c) Support for research infrastructures	10
Total	979

ANNEX II

THE GENERAL OUTLINES, THE SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES AND THE PRIORITIES

INTRODUCTION

The availability of secure, sustainable and competitive sources of energy is essential to economic growth, prosperity and quality of life in the industrialised world. Economic progress in the developing world will lead to major increases in global energy demand, with possible implications for fuel prices, and could have adverse effects on health and the environment. These problems can only be mitigated through concerted international effort to develop promising technologies. In view of the expected growth in demand for energy, continuing use will need to be made of all potential sources. Nuclear energy makes a significant contribution to the policy of diversifying energy supply and reducing overall emissions of CO₂.

Nuclear energy has the potential to provide Europe with a secure and sustainable electricity supply at a competitive price. Efforts to develop the safety and security of nuclear energy systems can strengthen the Community's industrial competitiveness, through exploiting the European technological advance and enhance the acceptability of nuclear energy. Minimising radiation exposure from all sources, including medical exposures and natural radiation, will improve the quality of life and will help in addressing health and environmental problems.

Strategic objective of the programme

The aim of this programme is to help exploit the full potential of nuclear energy, both fusion and fission, in a sustainable manner, by making current technologies even safer and more economical, and by exploring promising new concepts. It has three distinct components:

- a key action on controlled thermonuclear fusion, the aim of which is to further develop the necessary basis for a decision on and the possible construction of an experimental reactor, as well as basic concepts and technologies required in the longer term,
- a key action on nuclear fission, the aims of which are to enhance the safety of Europe's nuclear installations, to improve the competitiveness of Europe's industry, to ensure the protection of workers and the public from radiation and to help solve waste management and disposal problems,
- research and technological development activities of a generic nature, the aim of which is to consolidate and advance European knowledge and competence in several areas concerning radiological protection and health.

While nuclear fusion research is already fully integrated at a European level, greater and more effective integration of research will be pursued in the area of nuclear fission.

Aspects which are relevant to all parts of the programme comprise scientific and technological cooperation with third countries and international organisations to facilitate effective cooperation in important areas of research of mutual interest; the dissemination and optimisation of results; and the training and mobility of researchers to develop the synergy between research and training and facilitate the access to large-scale facilities.

The activities carried out under this programme will, where necessary, be closely coordinated with the Joint Research Centre's direct action programme, as described in the fifth framework programme of the European Atomic Energy Community for research and training.

(a) KEY ACTIONS

(i) Controlled thermonuclear fusion

Objectives and RT priorities

Within the context of the long-term objectives of the fusion activities set out in the fifth framework programme, the aim of this key action is to further develop the necessary basis for the possible construction of an experimental reactor (the 'Next step'), with the objective of demonstrating the scientific and technological feasibility of fusion power production as well as its potential safety and environmental benefits. In the longer term, it will prepare for the development of a demonstration reactor (DEMO). This activity will be accompanied by relevant physics and technology R&D activities, also involving European industry. In the context of this strategy, the prospect of constructing an experimental reactor should be pursued within the framework of international cooperation such as the international thermonuclear experimental reactor (ITER). This key action should thus enhance the Community's preparedness, from a scientific, technical, financial and organisational point of view, to decide on and support such a future experimental reactor.

The contribution of fusion to safe and clean base-load electricity generation will be investigated in the wider context of studies on the socioeconomic aspects of fusion. The mobility and training of scientific and technical personnel; the dissemination of results and the diffusion of information to the public will be an integral part of this key action.

The above strategy will entail three main lines:

— *Next-step activities*

The fusion physics and technology activities will aim to develop the capacity, especially within the associations, JET and the European industry, to construct and operate an experimental reactor. Europe will continue to participate in the ITER engineering design activities (EDA) with a view to its possible construction.

Research priorities: to finalise the design, to complete the tests of prototypes and the supporting research; to finalise the procurement specifications; to consolidate the necessary scientific basis; adaptation of the design of the experimental reactor to at least one possible specific site within the EU and initiation of the dialogue with the potential licensing authorities; to complete the full-scale operation of JET; the possible extended use of the JET facilities by teams from organisations associated with Euratom to obtain further knowledge for the Next step will be explored,

— *Concept improvements*

Structured activities in the field of physics will focus on improving the basic concepts of fusion devices, including from the perspective of preparing the Next step and the conceptual definition of DEMO.

Research priorities: the construction, the exploitation and the upgrading of fusion devices, decided on during the previous framework programme and the upgrading of other existing devices; the diagnostics and the means of action on fusion plasmas; the continuation of theoretical studies; studies aiming at operating a remotely located fusion experiment; in addition to magnetic confinement, which includes the main line tokamak research and the pursuit of a range of options such as the stellarator, the spherical tokamak and the reversed field pinch, coordination in the context of a keep-in-touch activity of the national civil research activities on inertial confinement and possible alternative concepts,

— *Long-term technology*

Structured technological activities will be aimed at preparing, in the longer term, for the demonstration reactor (DEMO) and then a prototype reactor.

Research priorities: to develop tritium breeding blankets and a reference structural material for constructing DEMO-relevant modules; to carry out prospective studies on advanced low-activation and radiation-resistant materials for DEMO; a new safety and environmental impact assessment; a conceptual study of a DEMO reference design.

In addition, the socioeconomic aspects of fusion will be investigated. These socioeconomic studies will include evaluation of economic costs and of social acceptability of fusion, in comparison with other energy sources and should help in evaluating its potential to contribute to sustainable energy generation. Supplementing the technological activities, these studies will inform decisions for the future orientation of the programme.

(ii) **Nuclear fission**

Objectives and RT priorities

The main objectives are to help ensure the safety of Europe's nuclear installations, to improve the competitiveness of Europe's industry, to ensure the protection of workers and the public and the safe and effective management and final disposal of radioactive waste and to explore more innovative concepts that are sustainable and have potential longer-term economic, safety, health and environmental benefits. While mainly scientific or technological in nature, the research will also have a significant socioeconomic dimension. A further objective is to contribute, through education and training, towards maintaining within the Union a high level of expertise and competence in nuclear fission.

— *Operational safety of existing installations*

Research will focus on measures to maintain and improve the safety of existing installations, including the safety aspects of prolonging the lifespan of reactors.

RT priorities: to develop a common basis and common methods for determining safe residual lifespans; how ageing affects the integrity of structures and systems; improved methods of inspection and monitoring to enhance safety and reduce occupational exposure; modernisation of control systems; man-machine interface; organisation and management of safety,

— *Safety of the fuel cycle*

Research will be directed towards the development of improved methods for assessing, managing and enhancing the safety of the entire cycle, including existing reactors, to provide a better basis for policy choices, to promote the adoption of best safety practice that is both cost-effective and acceptable in a broader context, and to enhance public confidence. In particular, issues concerning the prevention and management of accidents and a scientifically founded approach to the management and disposal of radioactive waste will be addressed.

RT priorities: technological aspects of severe accidents, strategies and methods for the prevention, mitigation and management of accident and post-accident situations; to develop a common understanding and consensus on the management and disposal of radioactive waste, especially long-lived radioactive waste, and its reduction to a minimum including the potential use of chemical separation and transmutation of long-lived isotopes into short-lived isotopes; to test and demonstrate the technical feasibility of deep disposal in underground repositories, including the assessment of repository performance; the long-term behaviour of repository components and experiments in large-scale facilities including underground laboratories, improved methods for assessing and managing safety, including social aspects; development of best practices and maintaining and updating databases, including on decommissioning of nuclear facilities,

— *Safety and efficiency of future systems*

Research will focus on improving the safety and competitiveness of future systems and facilities in a sustainable development perspective, including advanced and more efficient fuels and more innovative or fundamentally new concepts for energy generation that offer advantages in terms of cost, safety (including the better management of wastes and utilisation of fissile materials), environmental impact and non-proliferation.

RT priorities: innovative reactor designs and waste-management concepts; new fuels including better utilisation of fissile material; optimisation of the fuel cycle as a whole, covering safety,

health and environmental aspects; enhanced passive safety features and control systems; longer service life for materials and equipment with less need for inspection and maintenance,

— *Radiation protection*

Research will be aimed at helping operators and regulatory authorities to protect workers and the public during operations in the nuclear fuel cycle, to manage nuclear accidents and radiological emergencies and to restore contaminated environments. It will focus on satisfying the objectives of the key action.

RT priorities: integrated risk management and optimisation of protection; real-time occupational exposure monitoring in workplaces; decision support, information exchange and monitoring strategies for emergency management; the restoration and long-term management of contaminated environments.

(b) RESEARCH AND TECHNOLOGICAL DEVELOPMENT ACTIVITIES OF A
GENERIC NATURE

Objectives and RT priorities

The objective is to consolidate and advance European knowledge and competence in the radiological sciences in order: to improve the safety and efficacy of industrial and medical uses of radiation; to better assess and manage exposure from natural sources of radiation; to support the development and practical application of radiation protection standards.

— *Radiation protection and health*

Research will focus on enhancing the understanding of the hazards related to ionising radiation, especially the effects of low-dose radiation, particularly on humans and improving the basis for estimating the risks of low and protracted exposure to ionising radiation.

RT priorities: biophysical and molecular-biological aspects of early and late biological effects and their impact on health linked, *inter alia*, to DNA lesions; epidemiology; prevention and treatment of radiation injury,

— *Environmental transfer of radioactive material*

Research will focus on improving our understanding of the behaviour of radioactive material in the environment, with a view to developing sound policy and good practice in managing the impact of natural and artificial sources of radiation in the environment.

RT priorities: behaviour and fluxes of radionuclides in the biosphere; evaluation of the vulnerability of different environments to radioactive contamination; conceptual and methodological bases for restoring contaminated environments,

— *Industrial and medical uses and natural sources of radiation*

Research will focus on enhancing the safety and efficacy of medical and industrial uses of radiation, on the better assessment and management of exposures to natural sources of radiation and on conceptual and methodological issues in achieving better radiological protection.

RT priorities: innovative approaches for medical diagnosis and industrial uses of radiation; optimisation of radiation protection in industry and medicine; management of exposure to natural radiation; risk perception and communication,

— *Internal and external dosimetry*

Research will focus on improving methods for assessing exposure to radiation from external or internal sources and developing innovative monitoring techniques which take advantage of progress in materials science and digital electronics.

RT priorities: dosimetry of complex radiation fields and incorporated radionuclides; retrospective dosimetry; innovative monitoring techniques.

(c) SUPPORT FOR RESEARCH INFRASTRUCTURES

Collaboration within Europe among nuclear research institutes and with other nuclear organisations is relatively well developed. This should be intensified in future in response to the ongoing rationalisation and downsizing of many national nuclear research programmes. More effective integration and better exploitation of research will be needed to continue ensuring safe use of nuclear energy and to keep European industry competitive.

Objectives and activities

The objective is to enhance access to and improve the consistency of the nuclear research fabric within the Community so that optimal use can be made of the available resources to the competitive advantage of European industry, and to continue ensuring the safe and acceptable exploitation of nuclear technologies.

Large-scale facilities

Continued access to large-scale facilities is essential and can be facilitated by shared use and collaborative programmes. Priority areas for support will include facilities for investigating core degradation, containment performance and materials testing, accelerators, underground laboratories for testing and demonstrating concepts for the deep geological disposal of wastes and for dosimetric and radio-biological experiments.

Networking

Existing networks will be reinforced and others established where they can demonstrably enhance the achievement of the programme objectives or broader Community goals: support for extensive and diverse networks, focusing on the key issues for nuclear safety, waste management and disposal, decommissioning, emergency preparedness and response, radiation protection, emerging safety or other technological issues.

Databases and tissue banks

Existing databases will be reinforced and others established where the need arises. Priority areas will include extending or establishing databases on: decommissioning and dismantling techniques; the performance and safety of waste disposal; the safety assessment of major components; the mitigation of severe accidents; epidemiological studies. A data bank of tissues and biological samples from patients treated by radiotherapy and people affected by nuclear accidents will also be established in order to develop, *inter alia*, joint epidemiological and biological studies on radio-induced lesions.

*ANNEX III***SPECIFIC RULES FOR IMPLEMENTING THE PROGRAMME**

The specific programme will be implemented through the indirect RT actions as provided for in Annex III to the fifth framework programme, with the exception of: (i) grants for cooperating with third countries; (ii) research training networks, which are defined in point 2 of this Annex. In addition, the following rules specific to this programme will apply:

1. Accompanying measures

The accompanying measures will comprise in particular:

- studies in support of the specific programme, including the preparation of future activities and in particular studies on socioeconomic aspects of fusion (such as the evaluation of costs and social acceptability),
- the exchange of information, conferences, seminars, workshops and scientific and technical meetings,
- recourse to external expertise, including access to scientific databases, in particular for the purposes of the monitoring of the specific programme provided for in Article 5(1) of the fifth framework programme, the external assessment provided for in Article 5(2) of the fifth framework programme and the evaluation of indirect RT actions and the monitoring of their implementation,
- dissemination, information and communication activities, including scientific publications, and activities for the exploitation of the results and the transfer of technologies. The dissemination activities will be carried out in accordance with the provisions of Title II, Chapter 2 of the Treaty,
- training schemes related to the RT activities covered by the specific programme, including special training courses for the key action on nuclear fission. The purpose of these special training courses is to maintain a high level of expertise and competence within the Community. They supplement the national training programmes when a particular need arises (e.g. Community added-value, subsidiarity). Particular attention will be given to training dedicated to the rapid dissemination of the results of national and Community research programmes,
- support for schemes to provide information and assistance for research players, including SMEs.

2. Supplementary training schemes

For the purposes of this specific programme, the following two training schemes, which will be limited in scope, will be implemented:

- grants for cooperating with third countries: under the key action on nuclear fission, these grants enable young research workers from the countries of central and eastern Europe and the new independent States of the former Soviet Union to spend time working at laboratories in the Community which are involved in implementing the specific programme,
- research training networks: set up in advanced or emerging fields of research, these networks deal with topics freely chosen by the researchers. Their main aim is to train young pre- and post-doctoral research workers.

3. Financial contribution

The levels of financial contribution towards the various indirect RT actions are as laid down in Annex III to the fifth framework programme.

In the case of the key action on controlled thermonuclear fusion, participation in the specific programme is envisaged within the framework of contracts of association with Member States (plus with Switzerland) or organisations in the Member States, within the framework of the JET joint undertaking, the NET Agreement or any related multilateral agreement between the Community and the associated organisations (which would also take account of the Community's participation in ITER-EDA) or other contracts of limited duration, particularly with organisations in a Member State which has no association.

In accordance with point 4 of Annex III to the fifth framework programme, projects are carried out in the frame of shared-cost research and technological development. These are implemented in accordance with the procedures laid down in the association contracts, the JET statutes, the NET Agreement, the ITER-EDA Agreement or any other multilateral agreement between the Community and the associated organisations and/or legal entities which may be set up subject to the approval of the advisory committee referred to in Article 6 of the specific programme. The creation of consortiums for integrated projects having a common objective will be encouraged.

The fifth framework programme will, as a general rule, make a uniform annual financial contribution of about 25 % towards the current expenditure of associations and towards contracts of limited duration. Having consulted the consultative committee referred to in Article 6 of the specific programme, the Commission may finance:

- the capital costs of specifically defined projects to which priority status has been awarded by the advisory committee referred to in Article 6 of the specific programme, at a uniform rate of 45 %,
- specifically defined activities (such as the possible use of the JET facilities after 1999), carried out under a multilateral agreement between Euratom and associated organisations or a legal entity, at a maximum rate of 75 %,
- procurements and services which can only be provided by industry, at a maximum rate of 100 %.

In the case of project and activities receiving a financial contribution up to 45 % or 75 %, all the associations and organisations taking part in the key action on controlled thermonuclear fusion have the right to take part in the experiments carried out on the equipment concerned. The detailed rules governing the Community's participation in the JET joint undertaking are laid down in the JET statutes, which were adopted by Council Decision 78/471/Euratom of 30 May 1978 on the establishment of the Joint European Torus (JET) joint undertaking⁽¹⁾.

The detailed rules governing the Community's participation in activities related to the detailed ITER project (ITER-EDA) are laid down in the EDA Agreement⁽²⁾, in Protocol No 2 to that Agreement and its accompanying documents⁽³⁾ and in the amendment extending the EDA Agreement and the relevant arrangements⁽⁴⁾.

4. Additional provisions concerning the rules for participation

The agreements referred to in the second indent of Article 5(1) of the rules for participation are agreements between the Community and the associated organisations and/or undertakings. The Committee referred to in Article 6 of the specific programme must be consulted on these agreements.

In accordance with Annex II to the fifth framework programme and with Article 5(3) of the rules for participation, legal entities established in countries of central and eastern Europe or in States which were formerly part of the Soviet Union may receive financing under the fifth framework programme in the area of nuclear fission, provided they make an essential contribution to achieving the objectives of the specific programme which cannot be provided by other means.

⁽¹⁾ OJ L 151, 7.6.1978, p. 10. Decision as last amended by Decision 98/585/Euratom (OJ L 282, 20.10.1998, p. 65).

⁽²⁾ OJ L 244, 26.8.1992, p. 13.

⁽³⁾ OJ L 114, 5.5.1994, p. 25.

⁽⁴⁾ OJ L 335, 10.12.1998, p. 61.

5. Coordination arrangements

The Commission will endeavour to ensure complementarity between the indirect RT actions under the programme, in particular by grouping them around a common objective, and to avoid duplication, while respecting the legitimate interests of proposers of indirect RT actions.

As far as possible, coordination will also be ensured between actions under the specific programme and those carried out in:

- other specific programmes implementing the fifth framework programme,
- the research, technological development and demonstration programmes implementing European Parliament and Council Decision No 182/1999/EC of 22 December 1998 concerning the fifth framework programme of the European Community for research, technological development and demonstration activities (1998 to 2002)⁽¹⁾,
- other European research frameworks including Eureka and COST,
- other Community research-related instruments.

It will comprise:

- (i) the identification of common themes or priorities, resulting in particular in:
 - the exchange of information,
 - the carrying out of work decided on jointly, entailing in particular the joint initiation of one of the procedures referred to in Article 8 of the rules for participation,
- (ii) the reassignment of proposals for indirect RT actions between the specific programme and the specific research, technological development and demonstration programmes of the fifth framework programme.

⁽¹⁾ Decision adopted on 22 December 1998 (not yet published in the Official Journal).

COUNCIL DECISION

of 25 January 1999

adopting a specific programme for research and training to be carried out by the Joint Research Centre by means of direct actions for the European Atomic Energy Community (1998 to 2002)

(1999/176/Euratom)

THE COUNCIL OF THE EUROPEAN UNION,

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

Having regard to the proposal from the Commission⁽¹⁾,

Having regard to the opinion of the European Parliament⁽²⁾,

Having regard to the opinion of the Economic and Social Committee⁽³⁾,

- (1) Whereas, by Decision 1999/64/Euratom⁽⁴⁾, the Council adopted a fifth framework programme for Community activities in the field of research and training for the European Atomic Energy Community for the period 1998 to 2002 (hereinafter referred to as the fifth framework programme) setting out the general outlines and scientific and technological objectives of the activities to be implemented by the Joint Research Centre (JRC) for the European Atomic Energy Community;
- (2) Whereas Article 3 of the fifth framework programme stipulates that it shall be implemented through specific programmes drawn up in accordance with Article 7 of the Treaty, one programme of which concerning in particular the JRC;
- (3) Whereas, in accordance with Article 4(2) of Council Decision 94/268/Euratom of 26 April 1994 concerning the fourth framework programme of the European Atomic Energy Community activities in the field of research and

training (1994 to 1998)⁽⁵⁾ and Article 7(3) of the Council Decisions on the specific programmes implementing the direct actions of the fourth framework programme, the Commission has arranged for an external assessment to be conducted which it has transmitted to the European Parliament, the Council and the Economic and Social Committee together with its conclusions and comments;

- (4) Whereas Council Decision 1999/66/Euratom of 22 December 1998 concerning the rules for the participation of undertakings, research centres and universities in the implementation of the fifth framework programme of the European Atomic Energy Community (Euratom) (1998 to 2002)⁽⁶⁾ allows the participation of the Joint Research Centre in indirect actions;
- (5) Whereas, for the purpose of implementing this programme, it may be appropriate to engage in international cooperation activities, in particular on the basis of Chapter X of the Treaty, with third countries or international organisations;
- (6) Whereas implementation of this programme will also comprise activities aimed at stimulating, disseminating and exploiting research results, in particular *vis-à-vis* small and medium-sized enterprises (SMEs), and activities to stimulate the mobility and training of researchers;
- (7) Whereas research activities under the fifth framework programme should also be geared towards innovation in order to contribute, *inter alia*, to the objectives of the first action plan for innovation; whereas the JRC should actively pursue activities in innovation and technology transfer;
- (8) Whereas the equal opportunities policy of the Community must be taken into account in the implementation of this programme;

⁽¹⁾ OJ C 236, 28.7.1998, p. 20.

⁽²⁾ Opinion delivered on 15 December 1998 (not yet published in the Official Journal).

⁽³⁾ OJ C 407, 28.12.1998, p. 123.

⁽⁴⁾ OJ L 26, 1.2.1999, p. 34.

⁽⁵⁾ OJ L 115, 6.5.1994, p. 31. Decision as last amended by Decision 96/253/Euratom (OJ L 86, 4.4.1996, p. 72).

⁽⁶⁾ OJ L 26, 1.2.1999, p. 56.

- (9) Whereas the Joint Research Centre (JRC) should implement the research and training activities carried out by means of direct action, in particular the tasks entrusted to the Commission by the Treaty; whereas the Commission should undertake the tasks incumbent on it in the area of nuclear fission, making use of the technical expertise of the JRC; whereas particular attention should be paid to the safety of the nuclear fuel cycle and its impact on man and the environment;
- (10) Whereas the implementation of this programme should be monitored with a view to adapting it, where appropriate, to scientific and technological developments and needs; whereas in due course there should also be an assessment of progress with the programme by independent experts;
- (11) Whereas, in the implementation of this programme, the Board of Governors of the JRC is consulted by the Commission in accordance with the relevant provisions of the Commission Decision concerning the organisation of the JRC; whereas the current provisions are set out in Commission Decision 96/282/Euratom ⁽¹⁾;
- (12) Whereas the Scientific and Technical Committee and the Board of Governors of the JRC have been consulted on the scientific and technological content of this specific programme,

HAS ADOPTED THIS DECISION:

Article 1

In accordance with Article 3(1) of the fifth framework programme, a specific programme related to direct actions of research and training activities to be carried out by the JRC (hereafter referred to as the specific programme) is hereby adopted for the period from 25 January 1999 to 31 December 2002.

Article 2

1. The amount deemed necessary for the execution of direct actions by the JRC under this programme is EUR 281 million.

⁽¹⁾ OJ L 107, 30.4.1996, p. 12.

An indicative breakdown of this amount is given in Annex I.

2. Of the amount in paragraph 1:

— EUR 71,8 million is for the period 1998 to 1999,
and

— EUR 209,2 million is for the period 2000 to 2002.

In the case referred to in Article 2(1)(c) of the fifth framework programme, the Council shall adapt the latter figure in accordance with Article 2(1)(c), second indent of the fifth framework programme. Pending a decision by the Council, this specific programme shall not be implemented beyond the provision of the first indent.

3. The budgetary authority shall, in compliance with the scientific and technological objectives and priorities laid down in this Decision, set the appropriations for each financial year taking into account the availability of resources within the multiannual financial perspective.

Article 3

1. The general outlines, the scientific and technological objectives and the priorities for the programme are set out in Annex II. They are consistent with the principles and the three categories of selection criteria indicated in Annex I to the fifth framework programme.

2. The detailed rules for financial participation by the Community in the specific programme are those referred to in Article 4 of the fifth framework programme.

Direct actions are defined in Annexes II and III to the fifth framework programme.

Specific rules for implementing the programme are set out in Annex III to this Decision.

Article 4

In the light of the criteria referred to in Article 3(1), and the scientific and technological objectives and priorities set out in Annex II, the Commission:

- (a) shall monitor, with appropriate assistance from independent external experts, the implementation

of the specific programme and, where appropriate, submit proposals to the Council for adapting it, in accordance with Article 5(1) of the fifth framework programme;

- (b) shall arrange for the external assessment provided for in Article 5(2) of the fifth framework programme to be conducted concerning the activities carried out in the fields covered by the specific programme.

Article 5

1. The Commission shall draw up a work programme specifying:

- (a) in greater detail, the objectives and priorities of Annex II;
- (b) the indicative timetable for the implementation of the specific programme.

2. This work programme shall be updated where appropriate and be made available by the Commission to all interested parties in a user-friendly form, including in electronic form.

Article 6

1. The Commission shall be responsible for the implementation of this programme, carried out by the JRC.

2. The Board of Governors of the JRC (hereinafter referred to as the Board of Governors) shall be consulted by the Commission in this task, in accordance with the relevant provisions of the

Commission decision concerning the organisation of the JRC.

3. The Commission shall regularly inform the Board of Governors of the implementation of this specific programme.

Article 7

The Commission may request the JRC to execute, on the basis of the criterion of mutual benefit, projects with legal entities established in third countries when this contributes effectively to the execution of direct actions.

Article 8

In accordance with Article 5(4) of the fifth framework programme, the Commission shall regularly inform the Council and the European Parliament of the overall progress of the implementation of the programme.

Article 9

This Decision is addressed to the Member States.

Done at Brussels, 25 January 1999.

For the Council
The President
J. FISCHER

ANNEX I

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

<i>(million EUR)</i>	
Type of activity	Amount
Nuclear fission safety	122
Nuclear safeguards	138
Decommissioning and waste management	21
Total	281 ⁽¹⁾ ⁽²⁾

⁽¹⁾ Of which approximately 6 % may be allocated to exploratory research and up to 2 % for exploitation of own JRC results and technology transfer.

⁽²⁾ This total includes the JRC's budget contribution necessary for its participation in shared-cost actions.

*ANNEX II***GENERAL OUTLINES, SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES AND PRIORITIES****A. THE MISSION OF THE JRC**

The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of Community policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Community. Close to the policy-making process, it serves the common interest of the Member States, while being independent of commercial or national interests.

Carrying out specific high-level research in close contact with industry and other bodies, the JRC supports the policy maker in addressing the concerns of the individual citizen, improving the interaction between man and the environment and promoting sustainable development.

In implementing its mission, the JRC will endeavour to coordinate research and training activities carried out in the Member States. Its work depends on intensive networking with public and private institutions in the Member States through, for example, research networks, joint projects or staff exchanges. This is important because the JRC's mission is complementary to the indirect action part of the fifth framework programme; while the indirect actions will continue to be the main mechanism for developing and testing new ideas, the JRC's role is to help apply them in the service of the policy maker.

B. OBJECTIVE: MAINTAINING A VIGILANT APPROACH

Nuclear energy continues to supply about a third of the Community's electricity and vigilance is still required to ensure a continuation of the Community's outstanding safety record, to maintain efforts to avoid proliferation and to efficiently manage the processing and long-term storage of waste. New challenges include a reactor park whose average age is increasing, an enlargement of the Community to include countries with a different safety culture and the coming into safeguards of material arising from the disarmament process.

The Commission has specific Treaty obligations in nuclear energy and it has always relied on the JRC to provide a technical support that can keep up with technological developments and face new challenges.

JRC's objective is therefore:

- to support the Commission in its Treaty obligations,
- to remain vigilant so as to maintain the Community's excellent record in safety and safeguards,
- to prepare to face the new challenges.

The two selection criteria for JRC activities are:

- relevance to Community policies. An understanding of the policy agenda allows JRC research to be timely and support the formulation of policy where it is most needed,
- subsidiarity. This has two aspects. Firstly the research must be in an area where Community involvement is appropriate and secondly it should be appropriate for this involvement to be through the JRC. Thus the JRC only operates where its unique pan-European identity provides an

added-value. In the nuclear area its action is justified by the cross-border aspects of nuclear safety and safeguards and by public concern about the issues.

C. THE JRC PROGRAMME

The JRC's specific programme for the fifth framework programme is shaped in a view to focus activities in areas where they have a high European added-value or which correspond to tasks entrusted to the Commission by the Euratom Treaty. These activities aim to optimise, in a European, or even international framework, the use of the JRC's special facilities and core competencies, in particular in areas where the JRC has acquired a level of excellence and is the unique holder of European knowledge.

Activities on fission safety will take advantage of the JRC's unique facilities and will focus on areas where the JRC is considered a reference centre for the Community such as actinides and areas of public concern such as severe accidents and the handling of waste. Work on ageing of reactor materials will increase to reflect the increasing importance of this issue for safety authorities and industry. The needs of the enlargement countries will be given some priority.

Work on control of nuclear materials will continue at the same level in order to meet the present and future needs of inspectors. This will include measurement, analysis and monitoring techniques and the training of inspectors. Some prospective studies will be carried out in order to foresee the safeguards implications of proposed changes in the fuel cycle and to determine whether remote sensing can be used for the detection of illicit activities.

Lastly, wastes issued from nuclear activities have to be properly managed and some obsolete facilities will be decommissioned.

This programme should not to be considered a blueprint for the work programme over the next four years but rather a general outline that reflects the current view of the policy agenda and priorities. Changes to the JRC programme are to be expected as science and technology advance and the policy agenda and the priorities of the customer change.

1. NUCLEAR FISSION

1.1. Nuclear fission safety

Even if nuclear fission is today considered a mature technology both the safety of nuclear installations and the management of the fuel cycle, notably the management of waste, require continued efforts as they are matters of public concern. Also public authorities maintain vigilance and push for continuous improvement and industry maintain a strong interest in new technologies and further improvements. The JRC supports these efforts which are at the core of its mission. It also offers unique facilities and traditional competence and scientific excellence while concentrating on activities where the added value by its support is unquestioned. They concern:

- the ageing of materials and components: determination of the residual lifespan of reactors and their main components, improvement and qualification of in-service inspection techniques through the evaluation of structural integrity and the development of methodologies and the qualification of non-destructive examination techniques,
- the fuel cycle safety: basic research on actinides is an area where the JRC is regarded as the centre of excellence, and in which it will produce detailed knowledge of the properties of these elements. This is essential to the whole fuel cycle safety and efficiency (basic properties of new fuel and waste, licensing and industrial operations such as reprocessing, processing, storage and disposal of waste and spent fuel), in particular it allows detailed studies of the phenomena occurring during irradiation of nuclear fuel, as well as the optimisation of those fuels to enhance both safety and efficiency (e.g. increase rate of irradiation, advanced fuels); studies on partitioning and transmutation will focus on lowering the radiotoxicity of waste by reducing, or even eliminating,

the presence of actinides and other long-lived radioactive elements in the fuel cycle, on the development of appropriate techniques for processing these materials,

- study of irradiated fuels with a view to direct disposal, in particular the characterisation of irradiated fuels, the examination of long-term behaviour under storage and final disposal conditions, and the determination of the risks associated with their radiotoxicity,
- the study of severe accidents, including the operation in a European network and with the support of international partners, of the FARO facility, the only one of its kind in the world, to allow the study of in-vessel and ex-vessel phenomena following core meltdown using real materials and representative configurations. The JRC will host in its large installations, in particular FARO, research teams from research organisms from Member States and reciprocally, it will contribute to European or international projects.

1.2. Nuclear safeguards

The scientific and technical support necessary to implement safeguards pursuant to Chapter VII of the Treaty and the obligations arising from the Non-proliferation Treaty and the implementation of the Commission's IAEA support programme is part of a dual process:

- to meet the technological challenges of the large fuel cycle facilities,
- and
- to meet the new challenges arising following major international decisions, as well as the incorporation of new, more efficient technologies.

The JRC's impartiality is essential to support actions to combat illicit trafficking in nuclear materials and damage to the environment involving radioactive materials. The JRC's activities in this field are an integral part of a process both of European cooperation, as reflected in the European Safeguards Research and Development Association network, and of international cooperation with the United States, Russia, Japan, Brazil, Argentina and Canada.

JRC activities will focus on:

- development and improvement of measurement, monitoring and analytical techniques with emphasis on automation: destructive and non-destructive testing and analytical techniques (including the development of high-performance analysis to detect traces of radioactive materials in the environment), sealing and confinement techniques, quality control; these activities concern in particular large reprocessing plants and the plutonium cycle, including MOX fuel, and will include the monitoring of performance in real operating conditions of industrial equipment and the study of its conformity with international standards,
- development of dedicated information technologies (processing techniques for the analysis and detection of anomalies between declarations and verifications; three-dimensional laser techniques for the monitoring of very sensitive areas); assessment of remote sensing as a method of detecting illicit nuclear activities; establishment of the requisite infrastructure for implementation for control purpose,
- evaluation with regard to controls on fissile materials, of certain innovative concepts in the field of reactors and the fuel cycle; preparation of an approach that is adequate in terms of control,
- development of analytical techniques adapted to the fight against illicit trafficking and environmental damage involving radioactive materials (e.g. illicit dumping): research on analysis of specific properties of fissile materials such as isotopic composition, purity and granulation to

evaluate intended use, date of fabrication, etc. and development of a database to collate these characteristics; development of ultra-sensitive analysis to make it possible to identify the routing of materials up to their place of seizure,

- training of inspectors and operators, in particular in new technologies.

2. DECOMMISSIONING OF JRC INSTALLATIONS AND WASTE MANAGEMENT

The JRC will undertake and intensify work on decommissioning and dismantling of its installations used for nuclear activities which have not been in use for some time and are becoming obsolete. This will include the treatment and management including disposal of waste resulting from this work. This is of vital importance not only to protect the environment but also for the protection of workers and the eventual reduction of operational costs as it will reduce the need for monitoring and surveillance as nuclear activities are being reduced and concentrated.

- Establishment of a long term plan in order to ensure future and continuous implementation of these activities,
 - Construction of an installation for the treatment of liquid wastes,
 - Starting of decommissioning and dismantling operation of obsolete facilities and management of wastes arising from these activities.
-

ANNEX III

SPECIFIC RULES FOR IMPLEMENTING THE PROGRAMME

1. The Commission, after consulting the Board of Governors of the JRC, shall implement the direct action on the basis of the scientific objectives and contents described in Annex II. The activities relating to this action shall be performed in the relevant institutes of the Joint Research Centre (JRC).
2. In the implementation of its activities, the JRC will, whenever appropriate and feasible, participate in or organise networks of public and private laboratories in the Member States or European research consortia. Particular attention shall be paid to cooperation with industry, especially with small and medium-sized enterprises. Research bodies established in third countries may also cooperate on projects, in accordance with the relevant provisions of Article 7 and, where applicable, of agreements for scientific and technological cooperation between the Community and the third countries concerned. Particular attention will be paid to cooperation with research laboratories and institutes in the countries of central and eastern Europe and the former Soviet Union.

The knowledge gained through implementation of the projects will be disseminated by the JRC itself (taking into account possible limitations due to confidentiality issues).

3. The accompanying measures shall include:
 - the organisation of visits to JRC institutes of grant holders, visiting scientists and seconded experts,
 - organisation of the secondment of JRC staff to national laboratories, industrial laboratories and universities,
 - systematic exchange of information, through, *inter alia*, the organisation of scientific seminars, workshops and colloquiums and scientific publications,
 - specialised training with the emphasis on multidisciplinary,
 - the independent scientific and strategic evaluation of the performance of the projects and programmes.
-