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Proposal for a

EUROPEAN PARLIAMENT AND COUNCIL DECISION

CONCERNING THE 5TH FRAMEWORK PROGRAMME OF THE  
EUROPEAN COMMUNITY FOR RESEARCH, TECHNOLOGICAL  
DEVELOPMENT AND DEMONSTRATION ACTIVITIES  
(1998-2002)

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Proposal for a

COUNCIL DECISION

CONCERNING THE 5TH FRAMEWORK  
PROGRAMME OF THE EUROPEAN ATOMIC ENERGY  
COMMUNITY (EURATOM) FOR RESEARCH AND TRAINING  
ACTIVITIES  
(1998-2002)

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(presented by the Commission)

# Explanatory Memorandum

## Introduction

For the European Union, the 5th Framework Programme for Research and Technological Development must be an opportunity to pursue a new approach to policy with regard to research conducted at Community level, which is designed to address contemporary issues and meet the aspirations of Europe's citizens.

With only three years to go before the new millennium, the European Union is entering a crucial phase in its history, busy with the historic work on the construction of Economic and Monetary Union and the redefinition of its institutional structure, notably with the prospect of the accession of new Member States.

The 5th Framework Programme needs to be an integral part of this process. In its own way, it should help European society enter the 21st century under the best possible conditions. To do so, it cannot simply be a continuation of the first four programmes. It is necessary to make a distinct break with them, otherwise the future of the idea underlying the Framework Programme would be jeopardised.

The world is changing too rapidly to adhere to the *status quo*. To meet the expectations of its citizens, the European Union must therefore be able to take action in response to a whole series of major developments:

- the issue of employment, a major source of concern for European citizens;
- society's growing requirements in terms of quality of life and health, in particular as regards the quality of food and the environment, and the growing number of questions being posed about the ethical and social consequences of the increase in knowledge;
- the globalisation of economic activity, trade, markets and knowledge, the spectacular acceleration of scientific and technological progress and the continuing rise in the cost of research;

- the emergence, alongside the three blocs of the "Triad", of new economic and industrial powers in Asia and in Latin America that will soon become scientific and technological powers as well.

The environment in which the 5th Framework Programme must be defined is therefore both profoundly new and changing. This means it is necessary to adopt a new approach to Community research that is open-ended enough to take account of the inevitable degree of uncertainty as to what the priorities and needs will be by the year 2000<sup>1</sup>.

### A new approach to Community research

For more than twelve years, the European Union has been conducting an original research and technological development policy through multiannual framework programmes. Despite the comparatively modest resources available to it, this policy has had a significant impact on the research activities carried out in the Member States. In particular, it has successfully resulted in the development of numerous trans-European collaboration networks.

A useful programming instrument, the Framework Programme has been transformed over the years into a general framework for a series of activities which, while of undoubted quality, have been carried out on topics which are clearly too numerous and dispersed. As a result of the constraints weighing down on its decision-making and delivery mechanisms, it has become an unwieldy instrument at times incapable of reflecting the realities and keeping up with the speed of social, economic and scientific developments.

Concentration and flexibility are the bywords for the changes required in the 5th Framework Programme. To be able to carry out optimally the tasks incumbent upon it within the European Union, the Framework Programme needs to be adapted in two ways:

- its decision-making and delivery mechanisms need to be thoroughly streamlined. This entails a changeover from adoption by unanimity,

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<sup>1</sup> Like its predecessor, the 5th Framework Programme is in fact made up of two separate legal instruments which cover, respectively, non-nuclear and nuclear research fields. The first of these is therefore to be adopted on the basis of the EC Treaty; the second on the basis of the EURATOM Treaty. In this explanatory memorandum the term "5th Framework Programme" always refers simultaneously to these two instruments.

which is the rule at present, to adoption by qualified majority. Such a modification is currently envisaged in the context of the work of the Intergovernmental Conference.

- it must be wholeheartedly at the service of a European Union research policy which is:
  - based on the three following basic principles:
    - scientific and technological excellence;
    - relevance to the main European Union policies;
    - European added value;
  - defined on the basis not only of scientific and technological factors but also of the European Union's economic and social needs and its overall competitiveness;
  - putting more emphasis on the dissemination and exploitation of results;
  - focusing on a limited number of objectives.

As noted in the "First Report on Economic and Social Cohesion", several of the priority themes proposed for the 5th Framework Programme are especially relevant to the reinforcement of socio-economic cohesion in the Union, notably the training and mobility of researchers, the promotion of innovation and the dissemination of research results, and the development of the information society, particularly the networking of researchers in the various fields.

To respond to public concern about the possible consequences of advances in knowledge and technology, careful thought needs to be given also to the ethical aspects of research and the application of research findings. Moreover, the research work carried out under the Framework Programme must explicitly comply with the fundamental ethical principles.

In order to ensure the transparency of the proposed approach for the 5th Framework Programme, a gradual, step-by-step procedure has been followed, with the successive submission of three documents: on 12 July 1996 the Communication "*Inventing Tomorrow*" which set out the broad guidelines proposed; on 20 November 1996 a first Working Paper giving more details about the structure; and on 12 February 1997 a second

Working Paper spelling out the scientific and technological objectives of the proposed activities.

In drawing up the proposal, due account was taken of the findings of the evaluation of the activities carried out during earlier periods, and especially the conclusions and recommendations of the panel, chaired by Etienne Davignon, responsible for the five-year evaluation of the Framework Programme.

### **Six broad themes for activities**

The new approach to defining the content of the 5th Framework Programme is seen straight away in the following two features:

- For the first time, precise objectives, basically of a socio-economic nature, have been set clearly and explicitly for all levels: for the Framework Programme as a whole; for the programmes of which it is composed; and lastly for the activities covered by those programmes;
- In addition, a set of detailed and objective criteria has been drawn up to define the content of the Framework Programme, grouped together in three "families": social objectives, chief among which is the impact on employment; scientific, technological and economic development, the basic objective being to increase the European Union's competitiveness; and last but not least the "European added value".

Used for the definition of the content of the 5th Framework Programme, these criteria will continue to be applied during the various stages of its implementation.

To make it easier to focus efforts on a smaller number of objectives, the 5th Framework Programme will be organised on the basis of six major programmes reflecting the four activities provided for in the Treaty for the implementation of the framework programmes: 3 "thematic" programmes corresponding to the first activity referred to in the Treaty; and 3 "horizontal" programmes corresponding to activities II, III and IV respectively. The general topics of these activities and the reasons for selecting them for activities to be conducted at European Union level are as follows:

## "Thematic" programmes

### – "Unlocking the resources of the living world and the ecosystem"

*Advances in knowledge and technology as regards the living world and the environment are essential for the implementation of European Union policies, in particular in the fields of health, agriculture, fisheries and the environment, as well as its industrial policy.*

*In this context, a broad range of new markets, bringing growth and employment, should soon emerge.*

*To ensure the exploitation of these markets in order to improve the quality of life of its citizens, the Union can build on its strong tradition in molecular biology and biochemistry, medical and pharmaceutical research, and agricultural and environmental sciences, and on its great potential in the corresponding areas of industry.*

### – "Creating a user-friendly Information Society"

*The creation of the Information Society can make a significant contribution to renewed growth and the appearance of new kinds of jobs in the Union: the development of information and communications technologies and their application will lead to the creation of several million jobs in Europe.*

*The Union is faced with intense international competition but concerned to preserve the cultural diversity which constitutes its wealth. It must therefore develop those technologies which will make it possible to create an original and user-friendly kind of Information Society.*

*The Information Society entails fundamental industrial and social change: its establishment is opening up many and varied possibilities for new activities, both for individuals and for companies, in the fields of trade, work, transport, education, health and culture. The technologies associated with the Information Society permeate every kind of industrial activity and all areas of society. Their economic and social impact far exceeds that of the industries which directly produce information and communications equipment and services.*

### – "Promoting competitive and sustainable growth"

*Strengthening the competitiveness of firms and moving towards harmonious and sustainable development are two complementary and inseparable objectives for the Union: the products and processes which will be competitive and create jobs on tomorrow's markets will also be "clean", intelligent products and processes.*

*The development, distribution and application of knowledge and technologies necessary to reach these goals are crucial for the implementation of the Union's industrial policy and its policies in numerous other fields, especially transport and energy in its various forms.*

*In these fields as in manufacturing industry, the aim must be to develop and disseminate high value-added systems, products and processes that are at the same time competitive, economic, efficient and environmentally safe.*

*The objective of competitive and sustainable growth should also be extended to maritime areas and to urban areas, in which most European citizens live and work.*

## “Horizontal” programmes

### – “Confirming the international role of European research”

*In a world characterised by increasing globalisation of economies, problems and issues, international cooperation has become an important aspect of EU research policy.*

*It contributes significantly to the implementation of the Union's external policy, especially towards the Central and East European accession candidates. It may enhance the role of the Union on the international stage.*

*Scientific and technological cooperation can also enable the Union to develop industrial cooperation and find a foothold in new markets.*

*It facilitates the access of European laboratories and firms to scientific knowledge available outside the European Union which is useful for the Union's purposes.*

### – “Innovation and participation of SMEs”

*Innovation is the key factor in industrial competitiveness. To enable European research to impact fully on growth and employment, and to help it achieve concrete outcomes and economically beneficial and socially desirable results, mechanisms need to be set up to promote innovation, exploit the results of scientific work and stimulate the creation of innovative companies.*

*Important vectors and actors in innovation, SMEs provide two thirds of employment in the European Union and should be able to benefit from easy access to the advanced technologies which they need, and to the possibilities offered by the Union's research programmes.*

### – “Improving human potential”

*In the field of science and technology, as in many others, Europe's prime asset is its human resources: the quality of its researchers, engineers and technicians.*

*In view of foreseeable needs, this human potential must be preserved, must grow in quantitative terms and must be used to the full. At the same time, the Union should help to promote European scientific and technological excellence.*

*To identify better current and future trends and economic and societal needs in Europe, it is also necessary to mobilise the strong European research tradition in economic and social sciences around a limited number of relevant topics.*

## Organising the programmes: greater focus and efficiency

The thematic and horizontal programmes are both complementary and interrelated. With a view to achieving maximum efficiency (in particular with regard to the exploitation of results and innovation), it is proposed that the greatest possible account be taken of the objectives of activities II, III and IV in the thematic programmes.

One of the main functions of the horizontal programmes is therefore to ensure coordinated implementation of all the activities related to their objectives at the level of the Framework Programme as a whole. While having their own objectives, the horizontal programmes will therefore help with the harmonious implementation of the thematic programmes.

The thematic programmes will be organised in such a way as to reconcile the desire to focus efforts on a limited number of objectives and the need to maintain and strengthen the European Union's science and technology base.

To this end, each of the three thematic programmes will comprise:

- a series of key actions;
- activities for research and development of generic technologies;
- activities in support of research infrastructures.

#### *Content of the "thematic" programmes*

##### *Key actions*

The key actions are a major innovation of the 5th Framework Programme. 16 of them are proposed, a figure which should not be exceeded given the desire to achieve concentration within the 5th Framework Programme. The key actions are linked to what can today be regarded as major economic and social objectives as far as the foreseeable future of the European Union is concerned. The key actions:

- will be defined according to problems to be resolved and explicitly formulated economic and social objectives;
- will mobilise, as part of an overall systems approach, the resources of various relevant disciplines, technologies and know-how, and relevant expertise of various origins;

- will cover the whole range of activities needed to achieve their objectives, ranging from basic research to development and demonstration;
- will be firmly rooted in a European context, one of their major objectives being to focus public and private research carried out in Europe on their particular topic;
- will be prepared and implemented in close consultation with the scientific community, businesses, and more generally all those who are concerned with and use research, on the basis of forms of association which may vary.

The key actions are designed to combine rigour and precision in the definition of the scientific and technological objectives and flexibility in the conditions and means of implementation (a bottom-up approach). In all, they will allow for increased flexibility in the establishment of partnerships and the funding and implementation of the work.

#### ***The activities for research and development of generic technologies***

These activities are the traditional component of earlier framework programmes, but will be conducted in a limited number of areas selected on the basis of the three families of criteria, and will complement the key actions.

Their aim is to help to maintain and develop the flow of ideas and knowledge in the European Union, as well as its technological capability, in a limited number of priority areas of research and generic technologies which have many potential applications and are not covered by the key actions.

#### ***The support for research infrastructures***

The twin objective pursued is to help optimise the exploitation of research facilities in Europe and increase the consistency of the European research fabric by promoting access to large facilities and centres of excellence, by supporting suitable projects, by networking facilities and by developing telematics networks for research.

### **Content of the "horizontal" programmes**

The "horizontal" programmes are at the crossroads of European Union research policy and its external policy, innovation policy, policy on education and training, promotion of personal mobility, as well as its social policy and employment policy. They will comprise:

- coordination, support and accompanying measures for activities related to their respective objectives carried out in the context of the "thematic" programmes;
- specific activities linked to the objectives of European Union policies in their respective fields which cannot find their place in the "thematic" programmes.

The two categories of activities will be carried out in close coordination both with each other and with the corresponding activities under the "thematic" programmes.

### **Improved and adaptable implementation: greater flexibility and simplicity**

To achieve the objectives assigned to the 5th Framework Programme, it will be necessary, in addition to revamping the content, to broadly reshape implementation in three ways:

- by making substantial improvements in coordination and flexibility at all levels;
- by making judicious use of the available range of implementation mechanisms;
- by improving and adapting management methods.

### **Coordination and flexibility**

An essential feature of the 5th Framework Programme, as compared with its predecessors, will be an improvement in the coordination of activities and in the flow of information and results between the programmes, as well as in the flexibility and response capability of the Union's activities.

## *Coordination*

Coordination between the different programmes will be achieved through the key actions, as well as through coordination activities carried out in the "horizontal" programmes.

At the same time, coordination between the research programmes and other Union activities will be tightened. This will be achieved, as far as international scientific and technological cooperation is concerned, by developing the links with technical and economic assistance programmes such as PHARE, TACIS and MEDA, through closer linkage between the research programmes and the programmes carried out in related areas such as education and training, and with the activities carried out in the context of the Structural Funds and other Community policies.

Greater coordination between European and national activities will be achieved through the key actions, through support for research infrastructures, and through cooperation (in particular in the form of joint work) with other European scientific and technological cooperation frameworks and organisations, such as Eureka, COST, ESA, EMBL, and CERN.

## *Flexibility*

Improvements in the flexibility and response capability of the Union's activities will be brought about by the regular adaptation of the work programmes as frequently as necessary, and the creation within each programme of a "free space" of limited size.

The aim is to be able to meet, in the shortest possible time, needs arising in the areas covered by the Framework Programme which were not explicitly foreseen or were not described in detail. The solution adopted is not to programme the assignment of the entire resources of the specific programmes from the outset, but to leave sufficient funds available, until three-fifths of the way through the life of the programmes, so that resources can be rapidly assembled on a particular topic and made available in the most appropriate form. (Conversely, it should be possible to terminate activities which turn out to be having too little impact).

### **Means of implementation**

The 5th Framework Programme will be implemented using several types of mechanism.

#### ***Shared-cost action***

Much of the Framework Programme will be implemented by means of different types of "indirect actions": "shared-cost" actions, concerted actions, support for collaborative networks, and demonstration projects.

Demonstration should play an important role in the implementation of the key actions. In all cases the Commission's contribution will vary according to the type of activities and proximity to the market, while complying with international rules and the provisions of the Community framework for State aid for research and development.

To ensure the additionality of resources, the Commission will take account, during the selection of proposals, of the research, investment and employment efforts being made by partners.

#### ***The JRC***

A second mechanism for implementing the 5th Framework Programme will be the Joint Research Centre. The JRC, which has its own evaluation capacity, is an impartial and independent scientific body.

The bulk of its contribution to the 5th Framework Programme will be in areas corresponding to this feature and to the objectives of the major Union policies. A leitmotiv for these activities will be "*Research at the service of the individual and citizens*" (health, safety, environment, consumer protection, action to combat fraud).

The JRC will also continue to carry out activities in the context of a "competitive" approach, by getting as close as possible to the end-users of its research, and in particular European industry, and by developing collaboration networks with other research bodies in the Member States.

### ***Other means: links with COST and Eureka***

Combining the resources of the Framework Programme with those of the European cooperation frameworks COST and Eureka makes it possible to increase the size and impact of the activities undertaken. Simple and efficient ways of associating European Union projects with COST and Eureka projects will therefore be developed.

The Framework Programme, COST and Eureka should become closely complementary. COST can give the Framework Programme the benefit of its flexibility and exploratory approach. Eureka can offer it prospects as regards the exploitation of results and market access: efforts will therefore be made to ensure that a bridge exists between the Framework Programme and Eureka, as work progresses, results are produced and projects get closer to the market, and as it becomes possible to define more detailed objectives. This approach will apply as a matter of priority to the most significant projects developed in the context of the key actions.

### ***Articles 130 k, l and n***

Use can be made of these articles to supplement the other activities under the Framework Programme, notably to implement activities of particular interest only to a certain number of Member States. Depending on the desire of Member States to embark on this type of initiative, one or more projects could be launched on this basis, arising from certain of the activities foreseen in the various programmes.

### ***Improved and adapted management methods***

During the various consultation exercises it was unanimously agreed that the 5th Framework Programme should be implemented using modern, well-adapted, efficient and transparent management methods.

Substantial progress has been made in this connection in recent years. Additional improvements will be made concerning, in particular, the streamlining of procedures and the reduction of delays. The objective is both to reduce the level of oversubscription and to improve access to programmes, notably for SMEs.

Where deadlines are concerned, a balance must be struck between the desire to process proposals rapidly and the requirements concerning the quality and objectivity of the evaluation, as well as the question of legal certainty.

Steps will be taken to improve management in particular by:

- pursuing a new approach to management, freed from all compartmentalisation, with use being made of methods of a "collegial" nature;
- adapting the management structure to the requirements of the 5th Framework Programme

To save a great deal of time in the processing of dossiers, and more generally to increase the overall efficiency of the implementation of the Framework Programme, in the final analysis, the only solution is to give the Commission the means to fully exercise the powers of programme implementation which have been conferred on it.

This is the opinion of the Framework Programme Evaluation Panel, which also recommends simplifying the current two-stage adoption and implementation procedure (Framework Programme and specific programmes), by making the Framework Programme itself legally enforceable.

As the provisions of the Treaty now stand, the Commission envisages that action should be taken at the level of the decisions made on the specific programmes. It plans to propose in this context that the bulk of the authority for implementing programmes should be delegated to the Commission alone, with the Programme Committees simply pronouncing on general matters (work programmes, adjustment of the indicative allocation of the amount) and not on individual measures.

With their composition and operation geared to the structure and contents of the six major programmes, the Programme Committees will continue to have their privileged position as a forum for monitoring programme implementation, providing an interface between Union policy and the national research policies and discussing the future priorities and medium- and long-term strategies for the field concerned.

One difficulty in programme implementation concerns the disparity of treatment of research fellows in the Member States, highlighted in the Green Paper entitled "*Education, training, research: the obstacles to transnational mobility*". In the context of the "*Improving human potential*" programme, the Commission will pave the way for an appropriate Community framework to rectify this situation.

### Legislation

The Framework Programme will only become properly attuned to the research needs of the Union once the Member States adopt it by qualified majority rather than unanimously.

This is regarded as essential by the Framework Programme Evaluation Panel. It is on the agenda of the Intergovernmental Conference.

On the hypothesis that the IGC does indeed decide along these lines, the President of the Evaluation Panel suggested that the Council, anticipating the Member States' ratification of the IGC's conclusions, could already act as if the rule of qualified majority were in place.

In view of the smaller number of programmes envisaged, the 5th Framework Programme as proposed could in any case be decided upon and implemented on the basis of about half as many as the 25 decisions needed for the 4th Framework Programme.

Alongside 2 Decisions for the EC Framework Programme and the Euratom Framework Programme (covering activities in the area of nuclear fission safety and controlled thermonuclear fusion) respectively, 11 separate Decisions would need to be adopted:

- six for the six "thematic" and "horizontal" programmes;
- one for the activities of the specific programme "*promoting competitive and sustainable growth*" with regard to nuclear energy;
- two for the JRC's activities in the EC and Euratom fields respectively;
- two for the participation rules in the EC and Euratom fields respectively.

## Financial and budgetary aspects

Since the European Council in Edinburgh in December 1992, research has been the most important item and a main priority of Category III of the Union budget. The priority attached to research was confirmed by the Commission in its preparation of the 1997 budget and in its discussion last January on budgetary and political priorities for 1998.

In the first working paper on the 5th Framework Programme of 20 November 1996 the Commission underlined this priority and reached a number of conclusions regarding the overall funding of the 5th Framework Programme: *“Research expenditure now appears in category III (internal policies) of the financial perspective. It is by far the biggest component, representing as it does 60% of the funds available under that heading in accordance with the spirit of the Edinburgh agreement (between one half and two-thirds of category III of the financial perspective). This approach could be followed for the 5th Framework Programme. Expected GNP growth will be taken into consideration in the forecasts of what might constitute an appropriate level for research expenditure in the Union.”*

The bulk of the 5th Framework Programme (1998-2002) will be executed under the new financial framework due to succeed the current one (1993-1999), which the Commission will be proposing in July immediately after the IGC. That is why the Commission is not yet able to make a formal proposal for the overall funding of the 5th Framework Programme.

To be able to start implementing the 5th Framework Programme at the beginning of 1999 (the 4th FP ends at the end of 1998) in accordance with the forecasts and in compliance with the requirements of SEM 2000, a very strict timetable will have to be adhered to. The 5th Framework Programme should thus be adopted by the Council and the European Parliament, acting under the co-decision procedure, in the first quarter of 1998. The specific programmes should be adopted by the Council (with only an opinion from the Parliament) by summer 1998. This would enable the programme committees to be set up, the work programmes established and the first calls for proposals to be sent out in the autumn of 1998.

**In view of these constraints, the Commission needs to make a formal proposal right away - as it has already undertaken to do. It will supplement the proposal with an overall figure for financing as soon as it adopts its proposal on the next financial framework immediately**

after the IGC ends in July 1997. However, the Commission considers that the average percentage of EU GNP reached by the 4th Framework Programme between 1995 and 1998 must represent a minimum for the overall funding of the 5th Framework Programme expressed as a percentage of average forecast GNP between 1999 and 2002.

The annual appropriations will be authorised by the budgetary authority within the limits of the financial perspective and within the maximum overall amount foreseen in the Treaty for the Framework Programme.

In this context the Commission considers that the indicative breakdown of the financial envelope corresponding to each of the activities proposed in the 5th Framework Programme should be according to the percentage figures given in the table below.

Certain aspects of this should be highlighted:

- The indicative breakdown between the three thematic programmes of the first activity of the EC Framework Programme is in three equal parts.
- The percentage devoted to the fourth activity of the EC Framework Programme (encouraging the training and mobility of researchers) on the basis of the programme on "Improving Human Potential" is the subject of a tangible increase.
- The percentage reserved for the EURATOM programme suffers a reduction with respect to previous Framework Programmes.

Beyond this, the sums allocated to direct actions (JRC) or actions which resemble direct actions (Nuclear fusion<sup>2</sup>) cannot decrease to below an incompressible minimum in their absolute value, without prejudice to the percentage figure which has been reserved for them.

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<sup>2</sup> Although formally an indirect action the Fusion programme is in fact an integrated programme which brings together the totality of Community and national activities in this field.

**Breakdown in percentage of the financial envelope of the framework programmes  
(5th FPRD):**

<b>EC</b>	<b>Framework programme</b>	<b>Indirect actions</b>	<b>86</b>	84	First action (Thematic RTD programmes) of which :
				28	-Living world and ecosystem
				28	-Information society
				28	-Competitive and sustainable growth
				3.5	Second action (International cooperation)
2.5	Third action (Dissemination and optimisation of results)				
10	Fourth action (Training and mobility of researchers)				
100	Sub-total				
	<b>Direct actions (JRC)</b>	<b>5</b>			
	<b>Sub-total</b>	<b>91</b>			
<b>EURATOM</b>	<b>Indirect actions (Fusion+Fission)</b>	<b>7</b>			
<b>Framework programme</b>	<b>Direct actions (JRC)</b>	<b>2</b>			
	<b>Sub-total</b>	<b>9</b>			
<b>TOTAL</b>		<b>100</b>			

## Conclusion

In preparing the 5th Framework Programme, the Commission has had the benefit of ideas from many sources, and in particular the European Parliament own-initiative report, the official contributions from the Member States, and the opinions of ESTA, IRDAC and CREST.

As recommended by the Evaluation Panel, it is proposed that a new type of Framework Programme be established, defined on the basis of a series of choices and priorities going beyond the mere juxtaposition of the wishes of the various parties, and conceived according to the interests and objectives of the European Union.

The discussions arising from the first three documents submitted by the Commission, in particular at a major conference held on 28 February and 1 March 1997, have highlighted the existence of a genuine consensus with regard to several aspects of the proposed approach.

The discussions which will shortly commence on this formal proposal should rapidly confirm the common desire of the Member States and Parliament to put this approach into practice, thus enabling the European Union to make its contribution towards "*Inventing Tomorrow*" for the benefit of European citizens.

**PROPOSAL FOR A DECISION OF THE EUROPEAN PARLIAMENT AND OF  
THE COUNCIL CONCERNING THE FIFTH FRAMEWORK PROGRAMME  
OF THE EUROPEAN COMMUNITY FOR RESEARCH, TECHNOLOGICAL  
DEVELOPMENT AND DEMONSTRATION ACTIVITIES**

**(1998-2002)**

97/0119 (COD)

**THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN  
UNION,**

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

Having regard to the proposal from the Commission<sup>1</sup>,

Having regard to the opinion of the Economic and Social Committee<sup>2</sup>,

Having regard to the opinion of the Committee of the Regions<sup>3</sup>,

Acting in accordance with the procedure laid down in Article 189b of the Treaty<sup>4</sup>,

Whereas a multiannual framework programme covering all Community activities,  
including demonstration activities, in the field of research and technological development  
should be adopted;

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)<sup>5</sup>, amended by Decision No 616/96/EC<sup>6</sup>,  
the Commission is required to have an external assessment conducted into the  
management of and progress with Community activities carried out during the five-years  
preceding that assessment, prior to presenting its proposal for a Fifth Framework  
Programme; whereas that assessment, the conclusions thereof and the Commission's  
comments have been communicated to the European Parliament, the Council, the  
Economic and Social Committee and the Committee of the Regions;

Whereas on 10 July 1996 the Commission adopted a communication<sup>7</sup> setting out the  
preliminary guidelines for the Fifth Framework Programme, stressing the need for the

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<sup>5</sup> OJ No L 126, 18. 5.1994, p. 1.

<sup>6</sup> OJ No L 86, 4.4.1996, p. 69.

<sup>7</sup> COM (96) 332 final.

latter to meet economic and social needs as a matter of priority; whereas that communication was followed by a first working paper of 20 November 1996,<sup>8</sup> which provided more details about the proposed objectives and the implementation mechanisms, and then a second working paper of 12 February 1997,<sup>9</sup> which set out in detail the possible content of the Fifth Framework Programme;

Whereas the objectives of the Community's research and technological development policy reflect current thinking about the challenges which the Community must meet and the opportunities which it intends to address relating, as a matter of priority, to the problems of society, industrial competitiveness, job creation, quality of life, globalisation of knowledge, contributing to the development and implementation of the Community's policies in line with Article 130f, paragraph 1 of the Treaty, and the role of the Community in the world as a focal point of scientific and technological excellence;

Whereas the Fifth Framework Programme should therefore focus, in the context of the first activity referred to in Article 130g of the Treaty, on a limited number of topics covering activities for the research and development of generic technologies, actions which bring together this type of activities in a coherent whole, targeted strategically on one and the same mobilising topic (hereinafter referred to as "key actions"), and support for research infrastructures;

Whereas, in addition, the Fifth Framework Programme should, in the context of the second, third and fourth activities referred to in Article 130g of the Treaty, include topics covering aspects specific to them and others, for horizontal coordination, in support of and interacting with activities of the same type carried out under the first activity;

Whereas this approach presupposes the maintenance and strengthening of the potential for scientific, technical and technological excellence existing within the Community taking full account of the efforts made by its main international partners; whereas this potential concerns both physical and non-tangible infrastructure and the human resources;

Whereas it is appropriate, in this same framework, to place special emphasis on small and medium-sized enterprises (SMEs), which generate a great deal of employment, on the diffusion and transfer of results, on innovation and on the training and mobility of researchers;

Whereas the formulation and implementation of the Community's policies and actions must take into account the objectives related to economic and social cohesion; whereas, in accordance with this principle, the framework programme must contribute to the harmonious development of the Community while maintaining scientific excellence as an essential criterion; whereas it is therefore necessary to strengthen the synergy between research and technological development activities and the action undertaken by the Community through the structural funds;

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<sup>8</sup> COM (96) 595 final.

<sup>9</sup> COM (97) 47 final.

Whereas, in accordance with the principles of subsidiarity and proportionality as provided for in Article 3b of the Treaty, the objectives of Community research and technological development policy reflected in the Fifth Framework Programme cannot be sufficiently achieved by the Member States, since they require the establishment of a critical mass in human and financial terms and a combination of expertise exceeding the confines of a single Member State; whereas these objectives can therefore, in view of the multiplier effects that they generate, be better achieved at Community level; whereas this Decision is limited to the minimum required to achieve these objectives and does not exceed what is necessary to this end;

Whereas the Community's financial participation in the actions of the framework programme may be varied at the level of the specific programmes according to the nature of the activities concerned and the proximity to the market, in specific and duly justified cases, in compliance with international rules and the provisions of the Community Framework for State aid for research and development<sup>10</sup>, in particular points 5.12 and 5.13 thereof;

Whereas the criteria that have been laid down to choose the topics covered by the Fifth Framework Programme and the related scientific and technological objectives take into account the above-mentioned principles; whereas those criteria should also be applied to the implementation of the Fifth Framework Programme in order to ensure consistency;

Whereas, in the implementation of the Fifth Framework Programme, a fair balance must be struck within the themes and in particular between the activities for research and development of generic technologies and the key actions, between the different themes of the Fifth Framework Programme, and between the Fifth Framework Programme and any other instrument with a direct or indirect link with the latter;

Whereas the Joint Research Centre will contribute towards the implementation of the framework programme in the areas of activities in which it provides impartial and independent expertise and the scientific and technical support needed for implementation of the various Community policies, and in addition, it will participate, in the context of consortia, in carrying out research activities foreseen by way of indirect actions;

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

Whereas, in addition to the annual report to be submitted to the European Parliament and the Council pursuant to Article 130p of the Treaty, in accordance with the recommendations to be implemented in respect of transparency and sound and efficient management, it is necessary to adopt arrangements for the systematic examination of the progress of the Fifth Framework Programme and its evaluation;

Whereas, in order to ensure consistency between the research activities undertaken under the Treaty establishing the European Community and those carried out under the

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<sup>10</sup> OJ C 45, 17.2.1996, p.5

Euratom Treaty, the Decision concerning the framework programme for nuclear research and training activities should be adopted at the same time as and for the same period as this framework programme;

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

**HAVE DECIDED AS FOLLOWS:**

**Article 1**

1. A multiannual framework programme for all Community activities, including demonstration activities, in the field of research and technological development, hereinafter referred to as the "Fifth Framework Programme", is hereby adopted for the period 1998-2002.
2. The Fifth Framework Programme shall, in accordance with Article 130g of the Treaty, comprise four Community activities. The first Community activity shall relate to the following three themes:
  - (a) unlocking the resources of the living world and the ecosystem;
  - (b) creating a user-friendly information society;
  - (c) promoting competitive and sustainable growth.

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

- (a) confirming the international role of Community research;
- (b) innovation and participation of small and medium-sized enterprises;
- (c) improving human potential.

The latter three themes will also be taken into account in the context of the first Community activity.

3. The criteria for selecting the themes referred to in paragraph 2 and the related objectives are set out in Annex I. They will apply for the implementation of the Fifth Framework Programme.
4. The general outlines of the Community activities, their scientific and technological objectives and the related priorities are set out in Annex II.

**Article 2**

1. The maximum overall amount for Community financial participation in the Fifth Framework Programme shall be ECU [...] million.
2. Annex III fixes the respective shares in each of the Community activities envisaged in Article 1 and indicates the breakdown between the themes in the first Community activity defined in Article 1(2).

### Article 3

1. The Fifth Framework Programme shall be implemented through seven specific programmes, three of which correspond to the three themes of the first Community activity, three are linked to the second, third and fourth Community activities respectively, and one is a programme specific to the Joint Research Centre.

Each specific programme shall specify the detailed rules for its implementation, fix its duration and provide for the means deemed necessary.

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

### Article 4

The detailed rules for financial participation by the Community in the Fifth Framework Programme shall be those laid down in accordance with the special provisions concerning research and technological development appropriations in the Financial Regulation applicable to the general budget of the European Communities, as supplemented by Annex IV to this Decision.

### Article 5

1. The Commission shall examine each year, with the help of appropriately qualified independent experts, the implementation of the Fifth Framework Programme and its specific programmes in the light of the criteria set out in particular in Annex I. It shall assess, in particular, whether the objectives, priorities and financial resources are still appropriate to the changing situation. Where appropriate, it shall submit proposals to adapt or supplement the framework programme and/or the specific programmes.
2. Before submitting its proposal for a Sixth Framework Programme, the Commission shall have an external assessment conducted by independent high-level experts into the implementation of Community activities carried out during the five years preceding that assessment in the light of the criteria set out in particular in Annex I. The Commission shall communicate the conclusions thereof, accompanied by its comments, to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions.
3. The independent experts referred to in paragraphs 1 and 2 shall be chosen by the Commission, which shall take account, in a balanced fashion, of the various research players.

**Article 6**

**All the research activities conducted pursuant to the Fifth Framework Programme shall be carried out in compliance with fundamental ethical principles.**

**Done at Brussels, ...**

**For the European Parliament  
The President**

**For the Council  
The President**

## ANNEX I

### CRITERIA FOR SELECTING THE THEMES AND OBJECTIVES OF COMMUNITY ACTIVITIES

The implementation of the European Community's research and technological development policy is based on the twin principles of scientific and technological excellence and the relevance of research activities to the objectives of the Treaty establishing the European Community.

In pursuit of a cost-benefit approach dictated by concern for optimum allocation of European public funding, the choice of themes for the 5th Framework Programme and the related objectives is made on the basis of a set of common criteria, divided into three categories.

• Criteria related to social objectives:

- *improving the employment situation,*
- *promoting the quality of life and health,*
- *preserving the environment,*

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

• Criteria related to economic development and scientific and technological prospects:

- *areas which are expanding and create good growth prospects,*
- *areas in which Community businesses can and must become more competitive,*
- *areas in which prospects of significant technological progress are opening up.*

• Criteria related to the Community "value added" and the subsidiarity principle:

- *need to establish a "critical mass" in human and financial terms, and the combination of the complementary expertise available in the various Member States,*
- *significant contribution to the implementation of one or more Community policies,*
- *addressing of problems arising at Community level or questions relating to aspects of standardisation or connected with the development of the European area,*

*so as to select only objectives which cannot be achieved through private research alone and are more effectively pursued at the Community level by means of research activities conducted at that level.*

These criteria will be used, and where necessary supplemented, for the implementation of the 5th Framework Programme, in order to define the specific programmes and select the research and technological development activities, including demonstration activities.

**ANNEX II**  
**BROAD LINES OF COMMUNITY ACTIVITIES**  
**SCIENTIFIC AND TECHNICAL OBJECTIVES**

**I. THEMES AND ORGANISATION OF THE 5TH FRAMEWORK PROGRAMME**

In accordance with Article 130g of the EC Treaty, the 5th Framework Programme will comprise four activities:

- the first activity covers the research, technological development and demonstration programmes;
- the second activity is aimed at promoting cooperation on research, technological development and demonstration with third countries and international organisations;
- the third activity concerns the dissemination and optimisation of the results of research, technological development and demonstration activities;
- the fourth activity is intended to stimulate the training and mobility of scientists.

**1. CONTENT AND ORGANISATION OF THE FIRST ACTIVITY**

The research, technological development and demonstration programmes will comprise:

- "key actions";
- activities for research and development of generic technologies;
- activities in support of research infrastructures.

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

**a) "Key actions"**

The aim of the key actions is to mobilise, in the context of an overall approach, the resources of different disciplines, technologies and know-how and related skills of various origins. They will fit into a European context and bring together a maximum of public and private effort on the subject concerned. The key actions have been strategically selected on the basis of the problems to be resolved and explicitly formulated economic and social objectives.

The research activities carried out in this context will cover the entire spectrum of activities needed to achieve the objectives, and range from basic research through development to demonstration.

**b) Activities for the research and development of generic technologies**

These activities, which are to be carried out in a limited number of areas selected using the criteria set out in Annex I, will complement the key actions. Their main aim is to help the European Community maintain and improve the flow of ideas and knowledge and its technological capability in those areas of research and enabling technologies which have many and varied potential applications but are not covered by the key actions.

**c) Support for research infrastructures**

The aim is to encourage optimum use to be made of the Community's research infrastructure and to improve the consistency of the European research fabric.

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

The horizontal themes are at the crossroads of the European Community's research policy and respectively its external policy, innovation policy, policy on education and training and the promotion of personal mobility, and its social and employment policy.

Each of them comprises:

- specific activities linked to the general objectives of the European Community's policy with regard to external relations, innovation and human resources which are not carried out as part of the themes of the first activity;
- activities essentially in the form of coordination, support and accompanying activities to ensure the coherence of equivalent activities carried out under the themes of the first activity.

## **3. THE JOINT RESEARCH CENTRE**

The Joint Research Centre is the scientific and technical body which the Commission needs to perform the tasks that it is empowered to conduct. The scientific and technological objectives of its activities are located more especially in areas requiring impartial and independent expertise at European Community level and in areas related to the objectives of its main policies.

These activities correspond to the scientific and technological objectives of the 5th Framework Programme described below, but must also respond to the requirements of and changes in the various Community policies where these result in specific research and development requirements, in particular when the Joint Research Centre's neutrality is essential.

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## **II. SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES**

### **FIRST ACTIVITY**

#### **1. UNLOCKING THE RESOURCES OF THE LIVING WORLD AND THE ECOSYSTEM**

*Improving the quality of life and health and addressing environmental problems are major challenges and the Community plans to tackle them by helping to increase knowledge and develop technologies in the fields of the living world and the environment.*

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

##### **a) Key actions**

##### **i) The living world and the ecosystem (I): health and food**

The aim of this key action is to promote the development of knowledge, technologies and methods, based on biotechnology, for example, to produce a safe, healthy, balanced and varied food supply for consumers. This requires as a priority:

- \* the development of new processing methods to improve food quality;

- \* the development of tests to detect and processes to eliminate infectious and toxic agents;
- \* study of the role of food in preserving health, in particular from the point of view of nutrition, epidemiology and public health.

ii) **The living world and the ecosystem (II): control of viral and other infectious diseases**

The priority objectives of this key action are the fight against Aids and control of the "new plagues" (such as the reappearance of tuberculosis and the emergence of diseases linked to new or mutant agents). Close attention is to be paid to:

- \* the development of vaccines, especially against viral diseases;
- \* treatment and prevention strategies;
- \* aspects connected with public health and care-delivery systems.

iii) **The living world and the ecosystem (III): the "cell factory"**

This key action is aimed at helping the Community's enterprises exploit the advances made in life sciences and technologies, particularly in the fields of health and the environment. It is aimed at the development of multidisciplinary technologies based on exploitation of the properties of micro-organisms, plants and animals at the cellular and sub-cellular levels. The objective is to develop new bio-molecules with high added-value capable of enhancing the quality of life and health, including:

- \* new health products (for example, antibiotics and anti-cancer agents);
- \* waste biotreatment processes;
- \* new biological processes for the agri-food industry.

iv) **The living world and the ecosystem (IV): management and quality of water**

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

- \* treatment and purification technologies;
- \* technologies for monitoring the quality and the level of groundwater and surface waters;
- \* surveillance, early warning and communication systems;
- \* technologies for the regulation of stocks and technologies for arid and semi-arid regions.

v) **The living world and the ecosystem (V): environment and health**

The aim of this key action is to help reduce the adverse impact on health of changes in the environment. It covers in particular issues such as prevention and the effects on health of air pollution, heavy metals and toxic substances, noise, climatic changes and electromagnetic radiation, as well as the effects of pollution at the workplace. It includes as a priority:

- \* epidemiological studies;
- \* the development of new methods of diagnosis, risk assessment and prevention;
- \* the development of processes to reduce causes and harmful health effects.

vi) **The living world and the ecosystem (VI): integrated development of rural and coastal areas**

The aim is to mobilise the knowledge and technologies needed to implement innovative approaches to production and exploitation, adapted to recent adjustments in the common agricultural and fisheries policies, whilst also providing the scientific basis for Community regulations. Priority areas include:

- \* new systems of production and exploitation in agriculture, forestry, fishing and aquaculture, taking into account profitability, the sustainable management of resources, product quality and employment;
- \* non-food uses;
- \* methods of control;
- \* the production of new models for the sustainable development of rural and coastal areas based on optimisation of the specific potential of each area, the diversification of activities and land use, and the involvement of the people concerned.

**b) Activities for the research and development of generic technologies**

Work will focus on priority research to support:

- the fight against age-related illnesses and health problems (e.g. Alzheimer's disease), degenerative diseases (in particular cancer and diabetes), cardio-vascular diseases, diseases of genetic origin and rare diseases; research into genomes and the neurosciences;
- the improvement of health systems, the enhancement of health and safety at work, and the fight against drug-related public health problems;
- the fight against major natural and technological hazards through the development of forecasting, prevention, impact assessment and mitigation techniques;
- understanding of the processes and interactions involved in "global change" on land, at sea and in the atmosphere, as well as their impact on ecosystems;
- the development of generic Earth observation technologies, notably satellite technologies,<sup>1</sup> for environmental monitoring and resources and ecosystem management;
- the study of problems relating to biomedical ethics and bioethics in the context of a respect for fundamental human values<sup>2</sup>;
- the study of the socio-economic aspects of development of the life sciences and technologies and of environmental change within the perspective of sustainable development (the impact on society, the economy and employment).

**c) Support for research infrastructures**

The priority is to make optimum use, at Community level, of databases and collections of biological material, centres for clinical trials, marine research facilities and computer centres for climate studies.

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<sup>1</sup> There will be specific coordination of the activities relating to "space technology" applications carried out within each of the three thematic programmes.

<sup>2</sup> No research activity which modifies or is intended to modify the genetic heritage of human beings by alternation of germ cells or by acting at any other stage in embryonic development and which can make such alteration heritable will be carried out under the present Framework Programme. In the same way, no research activity, understood within the term "cloning" will be conducted with the aim of replacing a germ or embryo cell nucleus with that of the cell of any individual, from an embryo or coming from a later stage of development to the human embryo.

To the extent possible, animal experiments and tests on animals should be replaced with *in vitro* or other alternative methods. Modification of the genetic heritage of animals and animal cloning will be envisaged within the current Framework Programme only for objectives which are justified on ethical grounds and to the extent that the operations involved are effected on an ethical basis, with respect for the well being of animals and the principles of genetic diversity.

## 2. CREATING A USER-FRIENDLY INFORMATION SOCIETY

*The advent of the Information Society is opening up the possibility of a wide range of new activities, for both individuals and companies of the Community, in the fields of trade, work, transport, environment, education and training, health and culture. Continuous efforts in relation to research, technological development and technology take-up are necessary to realise the full potential of the Information Society. The technological range of key actions allows the possibility of a flexible concentration and a dynamic implementation of the activities, reflecting socio-economic priorities.*

*These efforts must, in all activities, tackle the universal issues such as access, ease of use, cost-effectiveness and interoperability, as well as socio-economic impact.*

### a) **Key actions**

#### i) **Information Society (I): systems and services for citizen**

The aim of this key action is to provide users with easier access at the lowest cost to quality general-purpose services and boost the industry providing these services. In this context, it will be based on the following priorities:

- \* as regards health and the elderly: on computerised medical systems, on secure high-capacity health networks and telemedicine, on advanced interfaces and on tele-systems to integrate the elderly and the disabled into society;
- \* as regards the public authorities: on systems utilising multimedia and tele-systems;
- \* as regards the environment: on intelligent systems for analysis, surveillance, management and early warning;
- \* as regards transport: on the advanced intelligent systems needed for management and associated tele-services.

#### ii) **Information Society (II): new methods of work and electronic trading**

The aim of this key action is to help companies operate more efficiently and to make trading in goods and services more efficient. The priority topics will be:

- \* flexible, mobile and remote working methods, for individuals and for cooperative and group working and working methods based on simulation and virtual reality;
- \* management systems for suppliers and consumers, including interoperable payment systems;
- \* information and network security, including the technical means for authentication and the protection of integrity and intellectual property and 'privacy enhancing technologies'.

#### iii) **Information Society (III): multimedia content**

The aim of this key action is to facilitate life-long education and training, to stimulate creativity, promote linguistic and cultural diversity and improve the functionality and user-friendliness of future information products and services. It puts emphasis on the development of intelligent systems for education and training and of innovative forms of multimedia content, including audiovisual content, and tools for structuring and processing them. It will focus on four main lines:

- \* interactive electronic publishing with new methods for creating and structuring publications and for the personalised dissemination of information and accessing of cultural items through virtual libraries and museums;
- \* education and training: systems, services and software enabling the development and demonstration of new methods using multimedia, broad-band communications, simulation and virtual reality;
- \* new language technologies which help to make information and communications systems more user-friendly;

- \* advanced technologies for accessing, filtering and analysing information to help manage the information explosion and facilitate the use of multimedia contents, notably as regards geographical information systems.

**iv) Information Society (IV): essential technologies and infrastructures**

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

- \* computing, communication and network technologies, together with their implementation and application;
- \* technologies and engineering for software and systems including high-quality statistics;
- \* mobile and personal communications and systems, especially satellite-related services;
- \* interfaces making use of the various senses;
- \* peripherals, subsystems and microsystems;
- \* micro-electronics (technologies, expertise, equipment and hardware necessary for the design and manufacture of circuits and the development of applications).

**b) Activities for the research and development of generic technologies**

Universal issues such as access, ease of use, cost-effectiveness and interoperability and socio-economic impact will be fully addressed in all the key actions.

From a visionary perspective, covering future and emerging technologies and applications, research will focus as a priority on:

- technologies for the representation, creation and handling of knowledge;
- real-time and large-scale simulation and visualisation technologies and virtual presence technologies;
- quantum, photonic, bio-electronic technologies, and technologies for very large scale integration; ultra-high performance computers and super-intelligent networks.

**(c) Support for research infrastructure**

The priority is to provide support for the advanced high-speed computer systems needed for research in all fields of science and technology, for example advanced INTERNET-2.

### 3. PROMOTING COMPETITIVE AND SUSTAINABLE GROWTH

*The objective is to produce and disseminate the knowledge and technologies needed to design and develop processes and produce "clean", high-quality products that will be competitive on tomorrow's market, to help increase growth and create new jobs in Europe and to give firms the opportunity to make the necessary changes to their activities.*

*This goes hand in hand with the development of high-performance energy systems and services, and transport systems which are economic, safe, and protective of the environment and quality of life.*

#### a) **Key actions**

##### i) **Competitive and sustainable growth (I): products, processes, organisation**

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

- \* the elaboration, development and integration of new technologies for design, manufacturing, control and production, in particular using microengineering;
- \* Information Society technologies for "intelligent" manufacturing (including flexible workshop systems and systems for flexible management of supply and distribution chains, embedded systems and tele-services for operation and maintenance and simulation and shared-work technologies);
- \* technologies to reduce resource utilisation and promote reuse and recycling of waste and the development of clean processes and products based on the concept of "life cycle analysis";
- \* new methods of organising production and work and of using skills (including socio-economic analyses).

##### ii) **Competitive and sustainable growth (II): sustainable mobility and intermodality**

The aim is to ensure the mobility of people and goods efficiently and without damage to the environment. This key action will contribute towards this by helping to set up a safe, intelligent, efficient and interoperable rail and road, air and maritime transport system for passengers and freight on a broadly intermodal basis at the European level to meet the mobility needs of industry and the public. This requires as a matter of priority:

- \* the development, validation and demonstration of modal and intermodal transport management systems, including second-generation satellite navigation and positioning systems;
- \* research on infrastructures and their interfaces with transport facilities and systems, while reducing the environmental impact and taking account of accessibility and the integration of regional planning and transport policies;
- \* the development of socio-economic scenarios for the mobility of people and goods.

##### iii) **Competitive and sustainable growth (III): new perspectives in aeronautics**

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

- \* the development and demonstration of advanced technologies for integrated design and production, the reduction of energy consumption, emissions and noise for various aircraft concepts;
- \* the technological and economic feasibility of and the critical technologies for new-generation aircraft concepts;
- \* the development of technologies to improve operational safety.

**iv) Competitive and sustainable growth (IV): marine technologies**

The aim is to encourage, whilst preserving the environment, the development and integration of knowledge and technologies, specific to sea-based applications to enable the Community to fully exploit the sea's potential and to improve the competitiveness of the marine industry, to support a veritable "sea" policy. The priority emphasis will be on the technologies needed:

- \* for the development of advanced ships which are safe and efficient;
- \* for the use of the sea as an economic means of transporting goods and passengers (advanced port infrastructure, regional maritime transport systems) in conjunction with the key action on "sustainable mobility and intermodality";
- \* for the rational and sustainable exploitation of the sea as a source of energy and mineral resources (in particular off-shore and subsea technologies).

**v) Competitive and sustainable growth (V): advanced energy systems and services<sup>3</sup>**

The aim of this key action, taking into account market needs, is to help satisfy the Community's demand for energy while minimising the risks to the environment. It helps to promote the development and improvement of advanced energy systems that are efficient in terms of both production and consumption, in particular to achieve a substantial reduction in CO<sub>2</sub> emissions and other greenhouse gases and to boost the Community's industrial competitiveness. Work will focus by way of priority on:

- \* the main new and renewable sources of energy and their integration, in particular, into decentralised systems;
- \* technologies for the storage and distribution of energy;
- \* technologies for the clean production and use of fossil fuels and for the rational use of energy;
- \* the elaboration of scenarios on economy/environment/energy interactions.

**vi) Competitive and sustainable growth (VI): the city of tomorrow**

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

- \* new models for the sustainable development of European cities, the elaboration of medium- and long-term socio-economic scenarios and research, development and demonstration activities focusing in particular on problems of town planning and architecture, social integration, safety, energy efficiency and conservation (in particular in buildings and in integrated management of transport) and democratic information networks (the concept of "digital cities");

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<sup>3</sup> Research activities relating to controlled thermonuclear fusion are described in detail in the proposal for the 5th Framework Programme of research and training under the Euratom Treaty.

- \* development and demonstration of technologies for economic, clean, effective and sustainable recovery, renovation and construction, in particular for large groups of buildings and for the protection of the cultural heritage;
- \* development and demonstration in an urban context of technologies for economic, clean, safe and intelligent vehicles (e.g. zero-emission vehicles), compatible with a context of sustainable mobility (cf. key action on "sustainable mobility and intermodality");

**b) Activities for the research and development of generic technologies**

The effort will be focused on the priority research needed<sup>4</sup>:

- to support the development of new and improved industrial materials and the processes for their manufacture: materials resistant to high temperatures and high pressure (e.g. for energy generation and engines); light materials (for transport and construction); functional materials (opto-electronics, biomaterials, sensors) designed and developed with ease of recycling in mind;
- for the development of new materials and production technologies in the coal and steel fields;<sup>5</sup>
- for measurements and tests to support standardisation, action to combat fraud, and the quality of products, and services (including the development of high-precision measuring instruments and certified reference measures and materials).

**c) Support for research infrastructures**

The priorities concern the networking and optimum use, at Community level, of computing centres for industrial research, high-power wind tunnels, specialised databases, laboratories and facilities for measurements and tests.

**SECOND ACTIVITY**

**1. CONFIRMING THE INTERNATIONAL ROLE OF COMMUNITY RESEARCH**

*The main purposes of the "international cooperation" activity are to contribute significantly to the implementation of the Community's external policy, especially towards the Central and Eastern European accession candidates, and to help the Community establish industrial cooperation and open up new markets.*

In the context of the Community's external policy, and with the accession of new Member States in mind, the general objectives of the "international cooperation" activity are:

- to promote scientific and technological cooperation between organisations and researchers from third countries and from the Community, likely to produce significant and balanced benefits for both sides (cooperation for "mutual benefit");

<sup>4</sup> The research to support nuclear safety and security in the programme on promoting competitive and sustainable growth is outlined in the proposal for the 5th Euratom Framework Programme.

<sup>5</sup> In the perspective of an increasing implementation within the Framework Programme, of activities currently being carried out on the basis of the ECSC Treaty, which expires in 2002.

- to facilitate access for research centres and businesses 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;
- to prepare for the accession of the associated Central and Eastern European countries (CEEC), to support the Euro-Mediterranean partnership, to stabilise the human potential of the CEEC and the Newly Independent States of the former Soviet Union (NIS) and to support development policy;
- to help European research players acquire information on research capacity, activity and priorities outside the Community (industrialised countries, "emerging economy" countries) so as to make Community industry more competitive and enhance its presence on the new markets.

International scientific and technological cooperation will be implemented in line with cooperation agreements, where these exist, through the specific "international cooperation" activity and through account being taken of the international dimension of research in the other activities of the Framework Programme.

(a) **Specific actions in the "international cooperation" activity**

On the basis of the cooperation policies the Community frames according to its relations with its various potential partners, three categories of action will be implemented, linked to specific problems facing these countries and not covered by the other activities of the Framework Programme. These actions will be financed through the specific "international cooperation" activity:

- Cooperation with certain categories of country:

CEEC: promotion of their centres of excellence.

MEDITERRANEAN THIRD COUNTRIES: notably, regional aspects of managing the Mediterranean Sea, support for socio-economic development including the information society, preservation of cultural heritage.

NIS: support for their research and technological development potential, specific targeted actions (satellite applications, regional problems linked to the environment and health).

DEVELOPING COUNTRIES (including Mediterranean and 'emerging economy' countries): study of the mechanisms and socio-economic conditions of sustainable development (for example agro-industrial research, energy systems); support for integrating productivity requirements and respect for the environment into these countries' ecosystems (for example water management); work to prevent and combat major diseases specific to these countries and to make their public health systems more effective.

- Training of researchers: a system of fellowships will be set up to give young researchers from developing countries (including Mediterranean and 'emerging economy' countries) a chance to spend time in Community laboratories and take part in Framework Programme research activities. Another fellowship scheme will be provided for young Community researchers to work in industrial laboratories in Japan and South Korea.

- Coordination with COST actions, the EUREKA initiative and international organisations involved in research activity; coordination of activities pursued through the other programmes of the Framework Programme - with one another, and with those pursued through the Community's other cooperation actions and with the Member States' cooperation activities.

(b) **International cooperation pursued through the other Framework Programme activities**

Four types of participation in the specific programmes are foreseen:

- full association with the Framework Programme: participation and Community funding for third country entities under similar conditions to Member State entities (EEA, some CEECs, Israel, Switzerland),
- participation in programmes open to third countries on the basis of bilateral or multilateral agreements: participation without Community funding for third country entities, on a project-by-project basis (certain industrialised and 'emerging economy' countries). Measures will be taken to enhance access to the Framework Programme for "emerging economy" countries,
- participation in programmes open to third countries without specific cooperation agreements: participation, in principle without Community funding for third country entities, on a project-by-project basis (CEECs not associated with the specific programmes, European NIS, Mediterranean partners),
- participation in projects in which it is in the Community's interest to involve third country participants: participation funded in principle by the third country or, in certain duly justified cases, as defined in the rules on participation adopted under Article 130j of the Treaty, by the Community through the specific programme concerned.

**THIRD ACTIVITY**

**1. INNOVATION AND PARTICIPATION OF SMEs**

*Innovation is the key factor in industrial competitiveness and job creation. The aim is to promote it, facilitate the exploitation of research results and foster the creation of innovative enterprises.*

*Small and medium-sized businesses are important vectors and actors in innovation. They should be provided with easy access to the advanced technologies which they need, and to the possibilities offered by the Community's research programmes.*

The general objectives of Community action in this area are:

- to improve the economic and social impact of programme research activities by reinforcing the mechanisms designed to ensure better exploitation of their results, as well as the transfer and dissemination of technology,
- to facilitate the access of programme participants, particularly SMEs, to the instruments which finance innovation and support the creation of innovative enterprises (financial engineering, venture capital),
- to stimulate SME participation in the research programmes - both SMEs active in research and high technology and those with little or no research capability but with substantial technological needs; to help SMEs, notably in the least favoured regions, to develop their technological capabilities,
- to help implement Community innovation policy, notably by adding a European dimension to national innovation systems.

Community efforts to promote innovation and support SME participation in research programmes must be undertaken in the dual framework of the various Community actions and the specific innovation and SME activity. The objectives and methods of these actions will be principally as follows:

(a) **Action specific to the "innovation and participation of SMEs" activity**

(i) *for innovation*

- rationalisation and coordination at Community level of networks providing information and assistance on the Community's research and innovation activities; management, in concert with the programmes, of the support network for innovation and technology transfer; consolidation of the mechanisms for gathering and disseminating information, such as the CORDIS information service (joint action: innovation/SMEs),

- creation and development of assistance activities in the area of intellectual property rights and access to private finance, notably venture capital funds (joint action: innovation/SMEs),

- definition, in concert with the programmes, of mechanisms (value analyses, market research, training) to facilitate, in the life-cycle of projects, the exploitation, private financing and transfer of technologies and results produced, while guaranteeing protection of the knowledge acquired,

- development, to this end, of the idea of "innovation units" to be set up in the programmes, coordination of their activities and help in creating innovative start-ups, principally via European organisations and funds (European Investment Fund, European Investment Bank, and the Eurotech Capital scheme),

- conception and definition of new methodologies for technology transfer actions integrating the technological, economic and social aspects of innovation,

- identification and dissemination of best practice in innovation and technology transfer (joint action: innovation/SMEs) and coordination of studies and analyses, particularly in the area of innovation policy.

(ii) *for SMEs*

- management of a 'one-stop shop' - for all the research programmes - in the Commission's departments for project proposals to be implemented specifically by SMEs; definition and management of common tools facilitating SME participation in the programmes (fullest possible use of electronic methods for information dossiers, submission of proposals, "help line", etc.).

(b) **Interaction with related actions in the other Framework Programme activities**

(i) *for innovation*

- ensuring that the setting-up and management of activities under the thematic programmes are consistent with those specific to the "innovation and participation of SMEs" activity; encouraging preparation for the exploitation and dissemination of results during the research phase.

(ii) *for SMEs*

Support for SME participation in the "cooperative research" activities and in the other research, technological development and demonstration activities to be carried out in the programmes.

- "cooperative research" activities enabling at least three mutually independent SMEs from at least two Member States to entrust jointly the resolution of their common technological problems to third legal entities.

- activities to support and encourage SME participation in collaborative and cooperative research projects (for example on the basis of "exploratory awards").

## FOURTH ACTIVITY

### 1. IMPROVING HUMAN POTENTIAL

*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, including towards enterprises, and by supporting better use of research infrastructure.*

*The Community also has a solid tradition of research in social and economic science which needs to be mobilised to identify economic and social trends and requirements, both current and future.*

The general objectives of this activity, to be realised in concert with related actions elsewhere in the Framework Programme, are:

- to develop the Community's human potential, notably through the training and mobility of researchers (including towards industry and in particular SMEs) and through innovation in the methods and technologies of education and training with a view to creating new jobs;
- to help make the Community an attractive location for researchers and for investment in research and to promote European research in the international arena;
- to encourage better use of research infrastructure;
- to develop the socio-economic knowledge base for a better understanding of key social and economic topics linked to the objectives of the Framework Programme and for the development of science and technology policy and other Community policies.

#### (a) Action specific to the "improving human potential" activity

This activity is structured in five main lines:

##### (i) *Reinforcing the Community's human research capital*

The objective is to establish:

- research training networks, created in advanced and emerging fields of research, on topics freely chosen by the researchers. The accent will be placed on the training of young researchers at pre and post-doctoral level.
- a coherent system of "Marie Curie" fellowships including: fellowships for young high-quality researchers with proven research experience, awarded for topics chosen by the researchers themselves; industrial host fellowships awarded to enterprises (including SMEs) for the training of young researchers; host fellowships to help develop high-level research capacity in the less favoured regions of the Community. Supplementary fellowship measures will include those to promote the mobility of researchers in both directions between industry and academia, and to provide travel bursaries to centres of excellence for doctoral studies.

(ii) *Improving the utilisation of major research infrastructures*

The aim is to promote optimum use of research infrastructures (large facilities, networks of distributed facilities, centres of competence) in those areas (including economic, legal and social sciences) not covered by other activities of the Framework Programme, or for categories of infrastructure not considered by those activities. To this end, measures are envisaged to help researchers with transnational access, to set up networks between infrastructure operators and to support research projects to improve access to infrastructures.

(iii) *Promoting scientific and technological excellence*

The objective here is to stimulate, through exchange, scientific and technological excellence and to make the most of the achievements of research. This will be achieved through support for high-level scientific conferences, the networking of Community researchers active outside the Community, distinctions for high-level research work, and action to raise public awareness and to make information on important scientific issues available to the public at Community level via electronic networks.

(iv) *Harnessing socio-economic research to the needs of society*

These actions cover a limited number of subjects linked to the general objectives of the Framework Programme and aim at defining the base for employment-generating social and economic development and for building a European knowledge society. Work will focus primarily on analysing the interplay between technological progress, employment, innovation in education and training, the legal environment and economic competitiveness; studying the socio-economic impact of the development of services and the "non-tangible" economy; producing and validating new development models fostering growth, employment and quality of life.

(v) *Supporting the development of science and technology policies in Europe*

This will be achieved by setting up an exchange forum in the form of the ETAN network (*European Technology Assessment Network*), bringing together political decision-makers and researchers specialised in the study of science and technology policies, by technology evaluation, watch and foresight activities, by the evaluation of scientific and technological choices; by the development of a system of statistics and scientific, technological and innovation indicators.

(b) *Interaction with related actions in the other Framework Programme activities*

This activity will include the coordination, support and accompanying actions needed to ensure consistency with related actions undertaken elsewhere in the Framework Programme on the aspects referred to in 1(a) above.

ANNEX III

5TH FRAMEWORK PROGRAMME (1998-2002)  
AMOUNTS AND BREAKDOWN

	ECU million (current prices)
First activity (research, technological development and demonstration programmes)	[ ]
Second activity (cooperation with third countries and international organisations)	[ ]
Third activity (dissemination and optimisation of results)	[ ]
Fourth activity (stimulation of the training and mobility of researchers)	[ ]
<i>MAXIMUM OVERALL AMOUNT</i>	[ ] <sup>1</sup>

Indicative breakdown between the themes of the first activity:

ECU million

- unlocking the resources of the living world and the ecosystem [ ]
- creating a user-friendly information society [ ]
- promoting competitive and sustainable growth [ ]

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[ ]

<sup>1</sup> Of which ECU [ ] for the JRC.

## ANNEX IV

### RULES FOR FINANCIAL PARTICIPATION BY THE COMMUNITY

The European Community will contribute financially to the research and technological development activities, including demonstration activities, hereinafter referred to as "indirect RTD actions" carried out under the programmes implementing the Framework Programme. In addition, it will carry out directly research and development activities hereinafter referred to as "direct RTD actions".

The key actions, the activities for the research and development of generic technologies, support for research infrastructures and the activities carried out in the context of activities 2, 3 and 4, as described in Annex II, will be implemented through indirect RTD actions and direct RTD actions.

#### 1. Indirect RTD actions

The indirect RTD actions will comprise five categories: shared-cost actions, training fellowships, support for networks, concerted actions and accompanying measures. Shared-cost actions will be the main mechanism for implementing the programmes.

The rate of financial participation by the Community in these actions will be as follows:

##### (a) Shared-cost actions

*- Research and technological development projects, demonstration projects, integrated projects:*

Research and technological development projects are projects designed to obtain new knowledge likely to be useful either to develop or significantly improve existing products, processes and services or to meet the needs of society. They will be financed in principle *at a level of 50% of the eligible costs*. In the special case of legal entities which do not keep analytical accounts, the additional costs generated as a result of the research will be financed at the rate of 100%.

Demonstration projects are projects which are designed to prove the technical viability of technologies and which cannot be commercialised directly. They will be financed in principle *at a level of 35% of the eligible costs*.

Integrated projects are projects with both a research and technological development component and a demonstration component. They will be financed *at a level corresponding to the weighted average of the levels applicable to the two components*.

*- Support for access to research infrastructures:*

Support will be granted to existing research infrastructures so that they can receive teams of Community researchers and enable them to optimise their research work.

Community funding granted as a contribution towards the optimum utilisation of infrastructures is set at *up to 100% of the additional eligible costs* connected with receiving teams of Community researchers and making the facility available.

- *Technology stimulation projects to encourage and facilitate SME participation in RTD activities:*

“Cooperative research” activities will be financed *up to 50% of the eligible project costs.*

“Collaborative research” activities will be financed in the form of an award covering *up to 75% of the eligible costs of the exploratory phase* of an RTD activity, including project validation and preparation, a feasibility study and partner search, during a period not exceeding 12 months.

**(b) Training fellowships**

In the context of the fourth activity, the Community “Marie Curie” fellowships scheme will comprise several categories: fellowships for young researchers with proven experience, industrial host fellowships for training young researchers and development host fellowships.

Under the fellowship scheme for young researchers with proven experience, fellows will receive an allowance designed solely to cover their subsistence expenses and proper social welfare expenses. They will also receive a contribution designed to take into account the costs involved in mobility.

In the context of the second activity, the fellowship schemes will on the one hand enable young researchers from developing countries to be given an opportunity to spend time in Community laboratories, and on the other enable young Community researchers to spend time in Japan and South Korea.

Community funding will cover *up to 100% of the eligible fellowship costs* and a contribution to the eligible costs of the host institution when it is in the Community.

**(c) Support for networks**

The thematic networks will bring together manufacturers, users, universities, research centres and organisations concerned with the diffusion or transfer of innovation around a given scientific and technological objective so as to facilitate the incorporation and transfer of knowledge, and cooperation between research players and users, ensure that market needs are taken into account more effectively and promote scientific and technological excellence. Community funding will cover *up to 100% of the additional eligible costs* of coordinating and implementing the thematic networks.

Research training networks will be created in advanced or emerging fields of research on topics freely chosen by the researchers. Their main aim will be to train young researchers at pre-doctoral and post-doctoral level. Community funding will cover *up to 100% of the additional eligible costs* connected with setting up and maintaining the network. The average maximum amount per partner per annum will be set in the specific programme to be adopted under the fourth activity.

**(d) Concerted actions**

Concerted actions will be designed to coordinate national RTD projects already in receipt of funding, in order to exchange experience acquired, to expand the research efforts of the various players so as to reach a critical mass, to disseminate results and to inform users. Community funding will cover *up to 100% of the additional eligible costs* connected with concertation.

**(e) Accompanying measures**

Accompanying measures will contribute towards the implementation of the specific programmes or the preparation of future activities, with a view to enabling them to achieve or define their strategic objectives. They will also seek to prepare or support the other indirect RTD actions. Measures devoted to the commercialisation of products, processes or services, marketing activities and sales promotion are excluded. Community funding may be *up to 100% of the eligible costs of the measures*.

In the Decisions adopting the specific programmes implementing the 5th Framework Programme there can be no derogations from the financial participation rates set above, with the exception of duly justified special cases. The Decisions may spell out in more detail the indirect RTD actions described above, supplement them or subject them to additional conditions or limitations.

The other rules for the financial participation of undertakings, research centres and universities in indirect RTD actions and for the dissemination of results are specified in the Council Decision adopted pursuant to Article 130j of the Treaty.

**2. Direct RTD actions**

The direct RTD actions to be implemented by the Joint Research Centre (JRC) will comprise research activities of an institutional character and scientific and technical support activities of an institutional character. The research activities of an institutional character are those for which the JRC has special or even unique facilities in the Community and which contribute to the implementation of Community RTD policy. The scientific and technical support activities of an institutional character are activities necessary for the framing and implementation of Community policies and tasks incumbent on the Commission pursuant to the Treaty which require the JRC's impartiality. Community funding will *normally be 100% of the costs of the direct RTD action*.

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

**PROPOSAL FOR A COUNCIL DECISION CONCERNING THE FIFTH  
FRAMEWORK PROGRAMME OF THE EUROPEAN ATOMIC ENERGY  
COMMUNITY (EURATOM) FOR RESEARCH AND TRAINING ACTIVITIES  
(1998-2002)**

(.../.../Euratom)

97/0120 (CNS)

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<sup>1</sup>,

Having regard to the opinion of the European Parliament<sup>2</sup>,

Having regard to the opinion of the Economic and Social Committee<sup>3</sup>,

Whereas a multiannual framework programme covering all research activities, including demonstration activities, and training activities in the field of nuclear energy, to be implemented by means of research and training programmes, can be adopted pursuant to Article 7 of the Treaty;

Whereas it has been held appropriate to adopt, for the period 1998-2002, a new framework programme in order to ensure the continuity of research and training activities in the field of nuclear energy;

Whereas, in accordance with Article 4(2) Council Decision 94/268/Euratom of 26 April 1994 concerning a framework programme of Community activities in the field of research and training for the European Atomic Energy Community (1994 to 1998)<sup>4</sup>, amended by Decision 96/253/Euratom<sup>5</sup>, the Commission is required to have an external assessment conducted into the management of and progress with Community activities carried out during the five years preceding that assessment, prior to presenting its proposal for the Fifth Framework Programme; whereas that assessment, the conclusions thereof and the Commission's comments have been communicated to the European Parliament, the Council and the Economic and Social Committee;

Whereas on 10 July 1996 the Commission adopted a communication<sup>6</sup> setting out the preliminary guidelines for the Fifth Framework Programme, stressing the need for the

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4 OJ No L 115, 6.5.1994, p. 31.

5 OJ No L 86, 4.4.1996, p. 72.

6 COM (96) 332 final.

latter to meet economic and social needs as a matter of priority; whereas that communication was followed by a first working paper of 20 November 1996,<sup>7</sup> which provided more details about the proposed objectives and the implementation mechanisms, and then a second working paper of 12 February 1997,<sup>8</sup> which set out the possible content of the Fifth Framework Programme;

Whereas European Atomic Energy Community research in the field of nuclear energy must reflect the current context of the need to develop safe and acceptable energy systems that respect standards and the environment and are competitive in terms of production costs;

Whereas the Fifth Framework Programme should therefore focus on areas covering activities for the research and development of generic technologies, action which brings together this type of activities in a coherent whole, targeted strategically on one and the same mobilising topic (hereinafter referred to as "key action"), and support for research infrastructures;

Whereas, furthermore, the Fifth Framework Programme should include, in addition to the thematic aspects, horizontal aspects covering cooperation with third States and international organisations, the dissemination and exploitation of the results of research and training activities and the training and mobility of researchers;

Whereas this approach presupposes the maintenance and enhancing of the potential for scientific and technological excellence existing within the Community, whilst taking into account the efforts of its main international partners; whereas that potential concerns both the physical and non-tangible infrastructures and human resources;

Whereas cooperation with all third States and international organisations must be stepped up, in particular in pursuit of the objective of the peaceful use of nuclear energy; whereas it is necessary that the Community continue to play an important international role in the field of nuclear fission safety, in particular with regard to the Central and East European countries and the States that have emerged from the former Soviet Union; whereas it is also important to continue, where appropriate, international cooperation activities with regard to third States in the field of controlled thermonuclear fusion;

Whereas under Article 4(1) of the Treaty Community research and training activities in the nuclear field must aim to complement action in the Member States; whereas Community action must therefore make it possible to bring added value to the efforts undertaken in the Member States;

Whereas the criteria established to choose the areas covered by the Fifth Framework Programme and the related scientific and technical objectives take into account the above-mentioned principles; whereas those criteria should also be applied to the implementation of the Fifth Framework Programme in order to ensure consistency;

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<sup>7</sup> COM (96) 595 final.

<sup>8</sup> COM (97) 47 final.

Whereas the Joint Research Centre will contribute towards the implementation of the framework programme in areas in which it provides impartial and independent expertise and the scientific and technical support needed for the implementation of the various Community policies; whereas, in addition, it will participate, in the context of consortia, in carrying out research and training activities;

Whereas the annual report to be submitted to the Council pursuant to Article 7 of the Treaty should also be submitted by the Commission to the European Parliament; whereas, in accordance with the recommendations to be implemented in respect of transparency and sound and efficient management, arrangements should also be adopted for the systematic examination of the progress of the Fifth Framework Programme and its evaluation;

Whereas a financial reference amount, within the meaning of point 2 of the declaration of the European Parliament, the Council and the Commission of 6 March 1995<sup>9</sup>, is included in the present decision for the whole duration of the Framework Programme, without prejudice to the responsibilities of the budgetary authority defined in the Treaty.

Whereas in order to ensure consistency between the research activities undertaken under the Euratom Treaty and those carried out under the Treaty establishing the European Community, the Decision concerning the framework programme of the European Community for research, technological development and demonstration activities should be adopted at the same time as and for the same period as this framework programme;

Whereas the Scientific and Technical Committee has been consulted by the Commission and has delivered its opinion,

HAS DECIDED AS FOLLOWS:

#### Article 1

1. A multiannual framework programme for all research activities, including demonstration activities, and training activities in the field of nuclear energy, hereinafter referred to as the "Fifth Framework Programme", is hereby adopted for the period 1998-2002.
2. The Fifth Framework Programme shall cover controlled thermonuclear fusion and energy systems related to nuclear fission.

Those two areas shall include, in addition to the thematic aspects, horizontal aspects concerning cooperation with third countries and international organisations, the dissemination and exploitation of the results of research and training activities, and the stimulation of the training and mobility of Community researchers.

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<sup>9</sup> OJ No C 102, 4.4.1996, p.4.

3. The criteria used for selecting the areas referred to in paragraph 2 and the related objectives are set out in Annex I. They shall apply for the implementation of the Fifth Framework Programme.
4. The general outlines of the areas, the scientific and technological objectives and the related priorities are set out in Annex II.

#### Article 2

The financial reference amount for the implementation of this framework programme for the period 1998-2002 is ECU [...] million.<sup>10</sup>

The annual appropriations will be authorised by the budgetary authority within the limits of the financial perspective.

#### Article 3

1. The Fifth Framework Programme shall be implemented through two research and training programmes, one of which shall be specific to the Joint Research Centre.

Each research and training programme shall specify the detailed rules for its implementation, fix its duration and provide for the necessary funds.

2. Implementation of the Fifth Framework Programme may give rise, where necessary, to supplementary programmes. It may also give rise to the conclusion of agreements with third countries or international organisations within the meaning of Article 101 of the Treaty.

#### Article 4

The detailed rules for financial participation by the European Atomic Energy Community in the Fifth Framework Programme shall be those laid down in accordance with the special provisions concerning research and technological development appropriations in the Financial Regulation applicable to the general budget of the European Communities, as supplemented by Annex III to this Decision.

#### Article 5

1. The Commission shall examine each year, with the help of appropriately qualified independent experts, the implementation of the Fifth Framework Programme and its research and teaching programmes in the light of the criteria set out in particular in Annex I. It shall assess, in particular, whether the objectives, priorities and financial resources are still appropriate to the changing situation. Where appropriate, it shall submit proposals to adapt or supplement the framework programme and/or the research and training programmes.

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<sup>10</sup> Of which ECU [...] for the JRC.

2. Before submitting its proposal for a Sixth Framework Programme, the Commission shall have an external assessment conducted by independent high-level experts into the implementation of the activities in the areas referred to in Article 1(2), carried out during the five years preceding that assessment, in the light of the criteria set out in particular in Annex I. The Commission shall communicate the conclusions thereof, together with its comments, to the European Parliament, the Council and the Economic and Social Committee.
3. The independent experts referred to in paragraphs 1 and 2 shall be chosen by the Commission, which shall take into account, in a balanced fashion, the various research players.
4. The Commission shall submit a report to the European Parliament and the Council at the beginning of each year. The report shall cover in particular the research and training activities carried out during the preceding year and the work programme for the year in progress.

Done at Brussels, ...

For the Council  
The President

## ANNEX I

### CRITERIA FOR SELECTING THE AREAS AND OBJECTIVES

The implementation of Euratom's research policy in the field of nuclear energy is based on the twin principles of scientific and technological excellence and the relevance of research and training activities to the objectives of the Treaty establishing the European Atomic Energy Community.

In pursuit of a cost-benefit approach dictated by concern for optimum allocation of European public funding, the choice of themes for the 5th Framework Programme and the related objectives will be made on the basis of a set of common criteria, divided into three categories.

- Criteria related to social objectives

- *improving the employment situation,*
- *promoting the quality of life and health,*
- *preserving the environment,*

*in order to attain major social objectives of Euratom reflecting the expectations and concerns of its citizens.*

- Criteria related to economic development and scientific and technological prospects

- *areas which are expanding and create good growth prospects,*
- *areas in which Community undertakings can and must become more competitive,*
- *areas in which prospects of significant technological progress are opening up.*

- Criteria related to the Community "value added" and the subsidiarity principle

- *need to establish a "critical mass" in human and financial terms, and the combination of the complementary expertise available in the various Member States,*
- *significant contribution to the implementation of one or more Euratom policies,*
- *addressing problems arising at Community level, or questions relating to aspects of standardisation or connected with the development of the European area,*

*so as to select only objectives which cannot be achieved through private research alone and are more effectively pursued at the Community level by means of research activities conducted at that level.*

These criteria will be used, and where necessary supplemented, for the implementation of the 5th Framework Programme, in order to define the research and training programmes and select the research activities, including demonstration activities, and training activities.

## ANNEX II

### BROAD LINES OF THE AREAS SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES

*Nuclear energy provides, without emission of CO<sub>2</sub>, more than 35% of the electricity generated in the European Community. It makes an important contribution to the policy of diversifying energy supply.*

*Efforts to develop the safety and security of nuclear energy systems strengthen in the short and medium terms, the Community's industrial competitiveness. The European technological advance can be exploited, in particular with a view to the emerging export markets.*

*In the longer term, technologies with promising prospects will require a large-scale research effort at Community and world level.*

#### I. AREAS AND ORGANISATION OF THE 5TH FRAMEWORK PROGRAMME

1. The 5th Framework Programme will cover controlled thermonuclear fusion and energy systems related to nuclear fission.
2. With regard to the thematic aspects, the Framework Programme will centre on:
  - a "key action" defined in terms of explicitly formulated economic and social objectives of the Community; the aim of this key action is to implement, in a European framework, general approaches based on the exploitation of a broad range of disciplines, technologies and know-how;
  - activities for the research and development of generic technologies;
  - activities in support of research infrastructures.
3. The horizontal aspects comprise:
  - cooperation with third countries and international organisations;
  - dissemination and optimisation of the results of research and training activities;
  - the training and mobility of researchers.
4. The activities of the Joint Research Centre:

The Joint Research Centre is the scientific and technical body which the Commission needs to perform the tasks that it is empowered to conduct. The scientific and technological objectives of its activities are located more especially in areas requiring impartial and independent expertise at European level and in areas related to the objectives of the Community's main policies.

These activities correspond to the scientific and technological objectives of the 5th Framework Programme described below, but must also respond to the requirements of and changes in the various Community policies where these result in specific research and development requirements, in particular where the Joint Research Centre's neutrality is essential.

## **II SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES**

### **a) Key action: Controlled thermonuclear fusion<sup>1</sup>**

The long-term objective of this action, embracing all the research activities undertaken in the Member States and Switzerland aimed at harnessing fusion, is the joint creation of prototype reactors for power stations to meet the needs of society: operational safety, environmental compatibility, economic viability.

The proposed strategy to achieve this long-term objective includes the development of an experimental reactor (The Next Step) and then of a demonstration reactor (DEMO).

Progress to date suggests the construction of the Next Step during the next decade is both technically feasible and strategically necessary. This should preferably take place within the framework of the ITER (International Thermonuclear Experimental Reactor) international cooperation project.

During the period from 1998 to 2002, implementation of the strategy will entail:

- \* the fusion physics and technology activities needed for the associations and European industry to develop the capacity to construct the Next Step and prepare to operate it; Europe will continue to participate in the detailed design activities for the ITER with a view to its possible construction;
- \* activities in the field of physics to improve the basic concepts of fusion devices;
- \* technological activities for the longer term which are essential to make progress with harnessing fusion.

The full-scale operation of the Joint European Torus (JET), the main instrument from which data can be extrapolated for the experimental reactor, will be completed. Once this Joint Undertaking ends, JET facilities could be used to obtain knowledge for use in the operation of the Next Step.

This key action will also encompass a fresh assessment of safety and environmental aspects; further studies on the socio-economic aspects; coordination, in the context of a keep-in-touch activity, of the Member States' civil research activities on inertial confinement; dissemination of results and the diffusion of information to the public.

### **b) Activities for the research and development of generic technologies<sup>2</sup>**

Work will focus on the following priority research:

- the operational safety of existing facilities, including issues relating to the extension of the lifespan of reactors, the technological aspects of severe accidents, and strategies and methods for the management of accident and post-accident situations;
- the security and safety of the fuel cycle; a joint, scientifically-founded approach to the management, disposal and minimisation of radioactive waste;

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<sup>1</sup> This activity supplements the key action "Competitive and sustainable growth (V): advanced energy systems and services" described in the proposal for the 5th European Community Framework Programme for research and technological development.

<sup>2</sup> This research supplements, in the field of nuclear energy, the activities for the research and development of generic technologies in the thematic programme "Promoting competitive and sustainable growth" of the proposal for the 5th EC Framework Programme.

- radiation protection, with the emphasis on understanding and awareness of the hazards related to ionising radiation, more especially the effects of low-dose radiation, the management of nuclear emergencies and the restoration of contaminated environments;
- studies on new nuclear facilities, advanced and more efficient fuels, future systems and concepts to increase the safety of the complete nuclear cycle and the competitiveness of industry, in particular in relation to outside markets; these studies will cover safety analysis, impact on man and the environment, and the most promising approaches from a technological and economic viewpoint in a sustainable development perspective;
- the development of technologies and methods for nuclear materials safeguards to meet the new challenges: changes in the fuel cycle, the sharp rise in the stock of fissile materials due to nuclear disarmament, the extra obligations arising out of new international agreements, the illicit traffic in fissile materials;
- the encouragement of cooperation with the Central and East European countries and the countries of the former Soviet Union: development of specific "international cooperation" research activities which will help improve the safety of nuclear reactors, waste management in these countries, radiation protection, and the control of fissile materials; development of coordination and international cooperation activities carried out under the Framework Programme. It will be possible to mobilise Community financing to facilitate such participation in accordance with rules to be adopted in the Decision on the specific programme.

**c) Support for research infrastructures**

This aims at optimum utilisation at Community level of nuclear energy research test facilities, in particular those which are important as regards the safety and competitiveness of this form of energy.

## ANNEX III

### RULES FOR FINANCIAL PARTICIPATION BY EURATOM

The European Atomic Energy Community will contribute financially to the research activities, including demonstration activities, and training activities, hereinafter referred to as "indirect RTDT actions", carried out under the programmes implementing the Framework Programme. In addition, it will carry out directly research activities, including demonstration activities, and training activities, hereinafter referred to as "direct RTDT actions".

The key action, the activities for the research and development of generic technologies, support for research infrastructures and the activities carried out in the context of themes of a horizontal nature, as described in Annex II, will be implemented through indirect RTDT actions and direct RTDT actions.

#### 1. Indirect RTDT actions

The indirect RTDT actions will comprise five categories: shared-cost actions, training fellowships, support for networks, concerted actions and accompanying measures. Shared-cost actions will be the main mechanism for implementing the programmes.

The rate of financial participation by Euratom in these actions will be as follows:

##### (a) Shared-cost actions

- *Research and technological development projects, demonstration projects, integrated projects:*

Research and technological development projects are projects designed to obtain new knowledge likely to be useful either to develop or significantly improve existing products, processes and services or to meet the needs of society. They will be financed in principle *at a level of 50% of the eligible costs*. In the special case of legal entities which do not keep analytical accounts, the additional costs generated as a result of the research will be financed at the rate of 100%.

Demonstration projects are projects which are designed to prove the technical viability of technologies and which cannot be commercialised directly. They will be financed in principle *at a level of 35% of the eligible costs*.

Integrated projects are projects with both a research and technological development component and a demonstration component. They will be financed *at a level corresponding to the weighted average of the levels applicable to the two components*.

- *Support for access to research infrastructures*

Support will be granted to existing research infrastructures so that they can receive teams of Euratom researchers and enable them to optimise their research work.

Community funding granted towards the optimum utilisation of infrastructures is set at *up to 100% of the additional eligible costs* connected with receiving teams of Euratom researchers and making the facility available.

(b) Training fellowships

In the context of the training and mobility of researchers, the "Marie Curie" fellowships scheme will comprise several categories: fellowships for young researchers with proven experience, industrial host fellowships for young researchers and development host fellowships.

Under the fellowship scheme for young researchers with proven experience, fellows will receive an allowance designed solely to cover their subsistence expenses and proper social welfare expenses. They will also receive a contribution designed to take into account the costs involved in mobility.

In the context of cooperation with third countries, the fellowship scheme will enable young researchers from third countries to be given an opportunity to spend time in Community laboratories.

Community support will cover up to 100% of eligible costs of the fellowship and a contribution to the eligible costs of the host institution when it is located in the Community.

(c) Support for networks

The thematic networks will bring together manufacturers, users, universities and research centres, and organisations concerned with the diffusion or transfer of innovation around a given scientific and technological objective so as to facilitate the incorporation and transfer of knowledge and cooperation between research players and users, and ensure that market needs are taken into account more effectively, and stimulate scientific and technological excellence. Community funding will cover up to *100% of the additional eligible costs* of coordinating and implementing the thematic networks.

Research training networks will be created in advanced or emerging fields of research on topics freely chosen by the researchers. Their main aim will be to train young researchers at pre-doctoral and post-doctoral level. Community funding will cover *up to 100% of the additional eligible costs* connected with setting up and maintaining the network.

(d) Concerted actions

Concerted actions will be designed to coordinate national RTD projects already in receipt of funding, in order to exchange experience acquired, to expand the research efforts of the various players so as to reach a critical mass, to disseminate results and to inform users. Community funding will cover *up to 100% of the additional eligible costs* connected with concertation.

(e) Accompanying measures

Accompanying measures will contribute towards the implementation of the specific programmes or the preparation of future activities with a view to enabling them to achieve or define their strategic objectives. They will also seek to prepare or support the other indirect actions. Measures devoted to the commercialisation of products, processes or services, marketing activities, and the promotion of sales, are excluded. Community funding may be *up to 100% of the eligible costs of the measures*.

In the Decisions adopting the specific programmes implementing the 5th Framework Programme there can be no derogations from the financial participation rates set above, with the exception of duly justified special cases, for the activity concerned, including those referred to in paragraph 3. The Decisions may spell out in more detail the indirect RTDT actions described above, supplement them or subject them to additional conditions or limitations.

The other rules for the financial participation of undertakings, research centres and universities in indirect RTDT actions are specified in the Council Decision on participation rules adopted pursuant to Article 7 of the Treaty.

**2. Direct RTDT actions**

The direct RTDT actions to be implemented by the Joint Research Centre (JRC) will comprise research activities of an institutional character and scientific and technical support activities of an institutional character. The research activities of an institutional character are those for which the JRC has special or even unique facilities in the European Atomic Energy Community and which contribute to the implementation of Euratom RTD policy. The scientific and technical support activities of an institutional character are activities necessary for the formulation and implementation of Community policies and tasks incumbent on the Commission pursuant to the Treaty which require the JRC's impartiality. The Community funding will *normally be 100% of the costs of the direct RTDT action*.

**3. Other actions**

The rules for participation by the Community in the JET Joint Undertaking, ITER activities, Contracts of Association and in certain tasks which can only be performed by industry will be specified in the corresponding research and training programme.

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