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<sup>(1)</sup> Text with EEA relevance

## II

*(Preparatory Acts)*

## COMMISSION

Second amended proposal for a European Parliament and Council Decision concerning the fifth framework programme of the European Community for research, technological development and demonstration activities (1998 to 2002) <sup>(1)</sup>

*(98/C 106/01)**(Text with EEA relevance)**COM(98) 8 final — 97/0119(COD)**(Submitted by the Commission on 14 January 1998)*


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<sup>(1)</sup> OJ C 173, 7.6.1997, p. 10.

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ORIGINAL PROPOSAL

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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,

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AMENDED PROPOSAL

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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  
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Acting in accordance with the procedure laid down in  
Article 189b of the Treaty,

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<sup>(1)</sup> OJ C 173, 7.6.1997, p. 10.

<sup>(2)</sup> OJ C 355, 21.11.1997, p. 38.

<sup>(3)</sup> OJ C 379, 15.12.1997, p. 26.

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<sup>(1)</sup> OJ C 173, 7.6.1997, p. 10, and OJ C 291, 25.9.1997,  
p. 15.

<sup>(2)</sup> OJ C 355, 21.11.1997, p. 38.

<sup>(3)</sup> OJ C 379, 15.12.1997, p. 26.

## ORIGINAL PROPOSAL

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 and technological development and demonstration (1994 to 1998) <sup>(4)</sup>, amended by Decision No 616/96/EC <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 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>(6)</sup> setting out the preliminary guidelines for the fifth framework programme, stressing the need for the 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 in detail the possible content of the fifth framework programme;

## AMENDED PROPOSAL

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 and technological development and demonstration (1994 to 1998) <sup>(4)</sup>, amended by Decision No 616/96/EC <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 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>(6)</sup> setting out the preliminary guidelines for the fifth framework programme, stressing the need for the 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 in detail the possible content of the fifth framework programme;

Whereas, following the Commission's communication of November 1994 <sup>(9)</sup>, the Council concluded in June 1995 that appropriate steps should be taken to promote cooperation and coordination between the Member States, in accordance with Article 130h of the Treaty;

<sup>(4)</sup> OJ L 126, 18.5.1994, p. 1.

<sup>(5)</sup> OJ L 86, 4.4.1996, p. 69.

<sup>(6)</sup> COM(96)332 final.

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

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

<sup>(4)</sup> OJ L 126, 18.5.1994, p. 1.

<sup>(5)</sup> OJ L 86, 4.4.1996, p. 69.

<sup>(6)</sup> COM(96)332 final.

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

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

<sup>(9)</sup> COM(94)438 final.

## ORIGINAL PROPOSAL

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(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 these types 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;

## AMENDED PROPOSAL

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, the improvement of the international competitiveness of Community industry, economic growth, job creation, environment, quality of life, globalisation of knowledge, contributing to the development and implementation of the Community's policies in line with Article 130f(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 research and technological development activities of a generic nature, actions which bring together these types 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 increased efforts in research and technological development investments 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, encouraging the emergence of a new generation of enterprising researchers with innovative ideas;

## ORIGINAL PROPOSAL

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;

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>(9)</sup>, in particular points 5.12 and 5.13 thereof;

<sup>(9)</sup> OJ C 45, 17.2.1996, p. 5.

## AMENDED PROPOSAL

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

Whereas promoting sustainable growth for Europe's economy and sustainable competitiveness for its industry requires strengthening its science and technology base in the medium or long term;

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;

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 accordance with the principles laid down in this Decision, especially in Annex IV thereto, and in compliance with internal 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;

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

## ORIGINAL PROPOSAL

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 abovementioned 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;

## AMENDED PROPOSAL

Whereas the budgetary authority will make every effort to reach the maximum overall amount provided that the financial perspective for the forthcoming period is compatible with the justified needs of all the other policies;

Whereas the maximum overall amount allocated to the fifth framework programme will be revised in the event of the accession of new Member States before the expiry of the framework programme;

Whereas the administrative expenditure arising from the research activities should be financed within the limits of the general amount allocated to the framework programme, and whereas it should however be included in the budget in a transparent fashion; whereas the budgetary authority requires of the Commission a detailed, comparable analysis of administrative expenditure and the implementation 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 abovementioned principles; whereas those criteria should also be applied to the implementation of the fifth framework programme in order to ensure consistency;

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

## ORIGINAL PROPOSAL

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 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 to 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:

## AMENDED PROPOSAL

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 the European Parliament has expressed its intention of setting up mechanisms allowing for scrutiny by its Members of the implementation of the framework programme, while not impinging on the Commission's executive role;

Whereas the Community equal opportunities policy must be taken into account in the implementation of the fifth framework programme;

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

## ORIGINAL PROPOSAL

- (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 14 833 million.

## AMENDED PROPOSAL

- (a) improving the quality of life and the management of living resources;
- (b) creating a user-friendly information society;
- (c) promoting competitive and sustainable growth;
- (d) preserving the ecosystem.

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 14 833 million.

If this amount is consistent with the financial perspective for the period 2000 to 2002, it shall be deemed to be confirmed. Otherwise, the annual appropriations allocated by the budgetary authority shall be consistent with the financial perspective for each of the years in that period, in compliance with the priorities set in this Decision.

The amount referred to in the first paragraph of this Article may be revised in the event of the accession of new Member States before the expiry of the framework programme.



## ORIGINAL PROPOSAL

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.

## AMENDED PROPOSAL

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).

All the administrative expenditure arising from the research activities shall be paid from the overall amount allocated to the programme. It shall appear in the same way as other comparable administrative expenditure in the Community budget. The Commission shall communicate each year, with the preliminary draft budget, detailed comparable analyses of administrative expenditure and the implementation thereof.

*Article 3*

1. The fifth framework programme shall be implemented through eight specific programmes, four of which correspond to the four themes of the first Community activity, three are linked to the second, third and fourth Community activities respectively, and 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.

## ORIGINAL PROPOSAL

## AMENDED PROPOSAL

*Article 5**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.

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.

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.

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**Article 6*

All the research activities conducted pursuant to the fifth framework programme shall be carried out in compliance with fundamental ethical principles.

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

## ANNEX I

## ANNEX I

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

## 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.

1. The European Community's research and technological development policy is directed towards strengthening the scientific and technological bases of Community industry and encouraging it to become more competitive at international level, while promoting all the research activities deemed necessary by virtue of other Chapters of the Treaty. Its implementation is based on the twin principles of scientific and technological excellence and relevance to the abovementioned objectives.

## ORIGINAL PROPOSAL

In pursuit of a cost-benefit approach dictated by concern for optimum allocation of European public funding, the choice of themes for the fifth 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.

## AMENDED PROPOSAL

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

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

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

- need to establish a 'critical mass' in human and financial terms, in particular through the combination of the complementary expertise and resources available in the various Member States,
- significant contribution to the implementation of one or more Community policies,
- addressing 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 are more effectively pursued at the Community level by means of research activities conducted at that level.

*Criteria related to social objectives*

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

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

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

- areas which are expanding and create good growth prospects,
- areas in which Community businesses can and must become more competitive,
- areas in which prospects of significant scientific and technological progress are opening up, offering possibilities for dissemination and exploitation of results in the medium or long term

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

## ORIGINAL PROPOSAL

*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 fifth framework programme, in order to define the specific programmes and select the research and technological development activities, including demonstration activities.

## AMENDED PROPOSAL

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

## ANNEX II

## BROAD LINES OF COMMUNITY ACTIVITIES

## SCIENTIFIC AND TECHNICAL OBJECTIVES

## I. THEMES AND ORGANISATION OF THE FIFTH FRAMEWORK PROGRAMME

In accordance with Article 130g of the EC Treaty, the fifth 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 in 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.

## ANNEX II

## BROAD LINES OF COMMUNITY ACTIVITIES

## SCIENTIFIC AND TECHNICAL OBJECTIVES

## I. THEMES AND ORGANISATION OF THE FIFTH FRAMEWORK PROGRAMME

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

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

## ORIGINAL PROPOSAL

## 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.

## AMENDED PROPOSAL

## 1. Content and organisation of the first activity

The research, technological development and demonstration programmes will comprise:

- ‘key actions’;
- research and technological development activities of a generic nature,
- activities in support of research infrastructures.

These programmes will, where appropriate, undertake studies and research activities on relevant ethical and legal aspects, within a context of respect for fundamental human values.

A particular effort will be made to ensure coherence between these socioeconomic research activities carried out in the various key actions in order to optimise the exploitation and dissemination of results by users.

Particular account will be taken of the economic and social implications of the implementation, use, and effects of the technologies and processes involved in each of these programmes. A particular effort will be made to ensure coherence between these socioeconomic research activities carried out in the various key actions in order to optimise the exploitation and dissemination of results by users.

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.

Synergy will be sought with other Community instruments, such as the Structural Funds, the EIF and the EIB.

(a) *Key actions*

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

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

## ORIGINAL PROPOSAL

*(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.

## AMENDED PROPOSAL

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

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

*(c) Support for research infrastructures*

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 its policies for external relations, innovation, SMEs and human resources, and for social and employment issues.

Each of them comprises:

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

In coordination and interaction with the horizontal programmes, the thematic programmes will take the necessary measures to actively contribute, in the context of their own activities, to the achievement of the general objectives of the horizontal programmes. Furthermore, the coordination of the different horizontal programmes among themselves will be ensured in order to reinforce their mutual contribution to the achievement of their own objectives.

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

## ORIGINAL PROPOSAL

**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 fifth 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.

**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, agroindustry, and the fields of health and the environment.

## AMENDED PROPOSAL

**3. The Joint Research Centre**

The direct research and technological development actions to be implemented by the Joint Research Centre (JRC) will comprise research and scientific and technical support activities of an institutional character. The JRC may provide support where it has special or even unique expertise and facilities in the Community or where it is tasked with activities necessary for the framing and implementation of Community policies and tasks incumbent on the Commission pursuant to the Treaty which require the JRC's impartiality (for example in the cases of standardisation and the monitoring of the application of certain Community policies).

The JRC is also progressively involved in competitive activities.

The Joint Research Centre will carry out these activities in close cooperation with: on the one hand, the Community's scientific community, in particular by strengthening its links with the main research institutes and, on the other hand, the Community's undertakings, in particular by developing its role as a technology transfer centre.

**II. SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES****FIRST ACTIVITY****1. Improving the quality of life and the management of living resources**

Improving the quality of life and health are major challenges, and the Community plans to tackle them by helping to increase knowledge and develop technologies in the field of the living world.

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, agroindustry, and health care.

## ORIGINAL PROPOSAL

(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.

## AMENDED PROPOSAL

(a) *Key actions*(i) **Quality of life and living resources: (I) health, food and environmental factors**

The aim of this key action is to promote the development of knowledge, technologies, processes and methods, including prenormative aspects, based on multidisciplinary approaches to produce a safe, healthy, balanced and varied food supply for consumers. It will also help to reduce the adverse impact of the environment on health, covering in particular, the issues such as the effects on health of air pollution, heavy metals, toxic substances, electromagnetic radiation, noise and the effects of pollution at the workplace. This requires as a priority:

- the development of safe, flexible and new or improved manufacturing processes and technologies to improve food quality and consumer acceptability, while guaranteeing traceability of raw materials and final products,
- the development of tests to detect and processes to eliminate infectious and toxic agents,
- research into the role of food in promoting and sustaining health with respect to diet and nutrition, toxicology, epidemiology, environmental interactions, consumer choice and public health,
- research into diseases and allergies related to or influenced by the environment, and research into their treatment and prevention,
- the development of new methods of diagnosis and risk assessment and of processes to reduce causes and harmful environmental health effects.

(iii) **Quality of life and living resources: (II): control of viral and other infectious diseases**

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

- the development of new and more effective vaccines, especially against viral diseases,
- new and improved treatment and prevention strategies,
- aspects connected with public health and care-delivery systems.



## ORIGINAL PROPOSAL

## (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.

## AMENDED PROPOSAL

## (iii) Quality of life and living resources: (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 understand the functioning of cells and to develop new bio-molecules with high added-value capable of enhancing the quality of life and health, including:

- new health-care processes, active substances and products (for example, antibiotics and anti-cancer agents),
- waste biotreatment processes,
- new biological processes for the agri-food industry.

## ORIGINAL PROPOSAL

## AMENDED PROPOSAL

(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, while 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,
- methods of control,
- non-food uses,
- 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:

(iv) **Quality of life and living resources: (IV): the ageing population**

The overall goal of this key action is to promote healthy ageing and independence in old age by preventing and treating age-related diseases and disability. Furthermore, it aims to help to reduce the need for long-term care and limit the constantly increasing costs of health care systems. The demographic and socioeconomic aspects will be taken into account in all the activities of this key action. Priority areas include:

- the fight against age-related illnesses and health problems (e.g. Alzheimer's and Parkinson's diseases as well as certain forms of cancer),
- understanding the genetic and molecular basis of healthy ageing and mechanisms leading to postponement of diseases and of disability,
- epidemiological and clinical research, study of aspects related to the public health-care system,
- improvement of the quality of life and better functioning of the elderly and disabled in society.

(v) **Quality of life and living resources: (V): 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, while also providing the scientific basis for Community regulations. The priority areas are as follows:

- new systems of production and exploitation in agriculture, forestry, fisheries and aquaculture, taking into account profitability, the sustainable management of resources, product quality and employment,
- methods of control,
- non-food uses,
- 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) *Research and technological development activities of a generic nature*

Work will focus on priority research to support:

## ORIGINAL PROPOSAL

- the fight against age-related illnesses and health problems (e.g. Alzheimer's disease), degenerative diseases (in particular cancer and diabetes), cardiovascular 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 socioeconomic 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.

<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 alteration of germ cells or by acting at any other stage in embryonic stage 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 of embryo cell nucleus with that of the cell of any replacing 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.

## AMENDED PROPOSAL

- the fight against degenerative diseases, cancer, diabetes, cardiovascular diseases, diseases of genetic origin and rare and orphan diseases; research into genomes and the neurosciences,
- the improvement of health systems, the enhancement of health and safety at work and the study of social medical or public health aspects of the use of drugs,
- research into issues concerning medical ethics and bioethics with regard to respecting fundamental human values<sup>(2)</sup>,
- research into the socioeconomic aspects of development of the life sciences and technologies.

(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 research and therapeutic trials, and fishery and aquaculture research facilities.

<sup>(2)</sup> No research activity which modifies or is intended to modify the genetic heritage of human beings by alteration of germ cells or by acting at any other stage in embryonic stage 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 of embryo cell nucleus with that of the cell of any replacing 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.

## ORIGINAL PROPOSAL

## 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 socioeconomic priorities.

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

(a) *Key actions*

## (i) Information society (I): systems and services for the 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.

## AMENDED PROPOSAL

## 2. Creating a user-friendly information society

The convergence between information processing, communication and content is increasingly important to all industrial and societal activities and are increasingly critical to Europe's competitiveness and quality of life. The advent of the information society is opening up the possibility of a wide range of new activities, for both individuals and companies in the Community, in the fields of commerce, 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 the key actions allows the possibility of dynamic concentration and flexible implementation of the activities, reflecting socioeconomic priorities.

These efforts must, in all activities, tackle universal issues such as usability accessibility, interoperability, dependability and affordability as well as socioeconomic impact.

(a) *Key actions*

## (i) Information society (I): systems and services for the citizen

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

- as regards health: on computerised medical systems, on secure high-capacity health networks and telemedicine,
- as regards the elderly and the disabled: on advanced interfaces and on tele-systems to integrate the elderly and the disabled into society,
- as regards public administrations: on advanced multimedia systems and tele-systems to facilitate access to and provision of services of public interest,
- as regards the environment: on intelligent systems for analysis, surveillance, management and early warning and support systems for the humanitarian disposal of landmines,
- as regards transport on the advanced intelligent systems needed for management and associated tele-services, including systems for tourism.

## ORIGINAL PROPOSAL

**(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.

## AMENDED PROPOSAL

**(ii) Information society (II): new methods of work and electronic commerce**

The aim of this key action is to develop technologies to help companies operate more efficiently and to make trading in goods and services more efficient and improve working conditions and the quality of work. 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, and analysis of social effects,
- management systems for suppliers and consumers, including systems supporting mass customisation and interoperable and secure payment systems,
- information and network security, including cryptography, techniques for combating and preventing piracy of computer sites, the technical means for authentication and the protection of integrity and intellectual property and privacy enhancing technologies,
- integrated applications platforms, covering the whole of this programme, paving the way for ‘digital communities’.

**(iii) Information society (III): multimedia content and tools**

The aim of this key action is to facilitate life-long education and training, to stimulate creativity, facilitate linguistic and cultural diversity and improve the functionality and user-friendliness of future information products and services. The research will place the 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 scientific, cultural and other items through networking of libraries, archives and museums,
- education and training: systems, services and software enabling the development and demonstration of new methods using multimedia, broad-band communications, simulation and virtual reality,
- new language technologies, including interfaces, which help to make information and communications systems more user-friendly,
- advanced technologies for accessing, filtering, analysing and processing information to help manage the information explosion and facilitate the use of multimedia contents, notably as regards geographical information systems.

## ORIGINAL PROPOSAL

## (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 socioeconomic 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.

## AMENDED PROPOSAL

## (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, including broad-band networks, together with their implementation, management, interoperability and application,
- technologies and engineering for software systems and services including high-quality statistics,
- real-time and large-scale simulation and visualisation technologies,
- mobile and personal communications and systems, including satellite-related systems and services <sup>(2)</sup>,
- interfaces making use of the various senses,
- peripherals, subsystems and microsystems,
- micro-electronics (technologies, tools, equipment and hardware necessary for the design and manufacture of circuits and the development of applications).

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

To make it possible to develop, from a visionary perspective, future and emerging technologies with a potential impact on industry and society, research topics could include, in a non-prescriptive way:

- technologies for the representation, creation and handling of knowledge,
- nanoscale, 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, including in the global context of the development of the Internet.

<sup>(2)</sup> There will be specific coordination of the activities relating to 'space technology' applications carried out within each of the thematic programmes concerned.

## ORIGINAL PROPOSAL

## AMENDED PROPOSAL

**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 micro-engineering,
- 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 socioeconomic analyses).

Member States shall continue to have responsibility for the promotion and expansion of national networks and infrastructure. The role of the European Community shall be to provide added-value to promote further opening, networking and interoperability.

**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 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, including those designed to improve the competitiveness of traditional industries, 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 micro-scale and nano-scale technologies and engineering,
- deployment, adaptation and integration of 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 re-use 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 socioeconomic analyses).

## ORIGINAL PROPOSAL

## (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 socioeconomic 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, while 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:

## AMENDED PROPOSAL

## (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 waterborne 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 rational modal and intermodal transport management systems, including second-generation satellite navigation and positioning systems<sup>(3)</sup> and the integration and use of advanced traveller and transport operator information services,
- research on infrastructures and their interfaces with transport means and systems, while reducing the environmental impact and taking account of accessibility and the integration of regional planning and transport policies,
- the development of socioeconomic scenarios for the sustainable 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, while 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:

<sup>(3)</sup> There will be specific coordination of the activities relating to 'space technology' applications carried out within each of the thematic programmes concerned.



## ORIGINAL PROPOSAL

- 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:

## AMENDED PROPOSAL

- 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, by maximising vessel performance and interoperability, 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).

*(This key action has been subdivided and transferred in an amended form to the new programme 'Preserving the ecosystem')*

(v) Competitive and sustainable growth (VI): the city of tomorrow and cultural heritage

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

<sup>(3)</sup> Research activities relating to controlled thermonuclear fusion are described in detail in the proposal for the fifth framework programme of research and training under the Euratom Treaty.

## ORIGINAL PROPOSAL

- new models for the sustainable development of European cities, the elaboration of medium- and long-term socioeconomic 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’),
- 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 (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).

<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 fifth 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.

## AMENDED PROPOSAL

- new models for the sustainable development of European cities and urban regions, the elaboration of medium- and long-term socioeconomic scenarios and research, development and demonstration activities focusing in particular on supporting and accompanying economic competitiveness, town planning and architecture, social integration, safety, energy efficiency and energy savings (in particular in buildings and urban transport) and information networks (the concept of ‘digital cities’),
- development and demonstration of technologies and products for diagnosis, protection, conservation, restoration and sustainable exploitation of the European cultural heritage, focusing on both movable and immovable cultural assets to promote their value and the quality of life,
- development and demonstration of technologies for economic, clean, effective and sustainable preservation, recovery, renovation and construction, in particular for large groups of buildings,
- development and demonstration of technologies for economic, clean, safe, efficient and intelligent vehicles, operating in the total transport environment, including its urban context, and compatible with a context of sustainable mobility (complementary to the key action on ‘sustainable mobility and intermodality’).

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

The effort will be focused on the priority research needed:

- 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 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 steel industry<sup>(4)</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).

<sup>(4)</sup> With the prospect of increasing implementation the framework programme of activities currently being carried out on the basis of the ECSC Treaty, which expires in 2002.

## ORIGINAL PROPOSAL

*(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.

## AMENDED PROPOSAL

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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.

**4. Preserving the ecosystem**

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

This objective goes hand in hand with economic development that respects the environment and the quality of life. It necessitates efficient and reliable energy systems and services.

*(a) Key actions***(i) Preserving the ecosystem (I): management and quality of water**

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

- treatment and purification technologies to prevent pollution, to purify water and to use and/or re-use water rationally (including closed loops; reliability of distribution networks),
- contribution to the development of integrated approaches to management of water resources and wetlands,
- technologies for monitoring and prevention of pollution, protection and management of ground-water and surface-water resources,
- surveillance, early warning and communication systems,
- technologies for the regulation and management of stocks and technologies for arid and semi-arid areas and generally water-deficient regions.

**(ii) Preserving the ecosystem (II): global environmental change and climate**

The aim of this key action is to develop the scientific and technological tools necessary to underpin implementation of Community policies, notably in relation to the environment and biodiversity, and to support the research obligations stemming from international treaties and conventions signed by the Community and its Member States. Primarily, the key action seeks to increase the understanding of processes in these areas in order to help deliver the goal of sustainable development. In this context the priorities are:

## ORIGINAL PROPOSAL

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- to understand, detect, assess and predict global change processes, with the emphasis on European and sub-regional causes and impacts, with respect to both natural and anthropogenic phenomena, in the context of the sustainable use of natural resources. The natural, socioeconomic and cultural sciences will be used,
- to foster better understanding of ecosystems,
- to develop scenarios and strategies for the prevention and mitigation of global change and for adoption to global change taking into account climatic change and the need for conservation of biodiversity,
- to support the development of the European component of the global observing systems for climate, terrestrial ecosystems (including biodiversity) and oceans (for example EuroGOOS — the European global ocean observing system),
- to develop the necessary scientific base (ocean processes and interactions, in particular at great depths) for sustainable use of the marine environment.

(iii) Preserving the ecosystem (III) promoting the sustainable use of energy <sup>(5)</sup>

The aim of this key action, is to develop and accelerate the adoption of technologies which offer the prospect of reducing energy demand, minimising impacts on the environment, CO<sub>2</sub> emissions, other greenhouse gases and other pollutants. Taking into account market prospects in the Community and globally, the long-term challenge is to lower energy intensity in all sectors of the economy. Research and technological development work will focus by way of priority on:

- the elaboration of scenarios on supply and demand management in economy/environment/energy systems and their interactions,
- technologies for the rational and efficient use of energy,
- the deployment and integration of new and renewable energies in decentralised systems,
- energy storage and distribution in local systems.

<sup>(5)</sup> Research activities relating to controlled thermonuclear fusion are described in the proposal for the fifth framework programme of research and training under the Euratom Treaty.

## ORIGINAL PROPOSAL

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- (iv) Preserving the ecosystem (IV) developing cleaner, more competitive and diversified energy supply <sup>(6)</sup>

This key action recognises that radically new energy technologies and systems must be developed to provide Europe with energy supplies and services which are reliable, efficient, safe and economic, thus contributing to industrial competitiveness and sustainable growth. Action is needed at every stage of the supply cycle to improve efficiency and reduce costs. In the short term the challenge is to develop energy technologies which lead to an early reduction of greenhouse gas emissions and in the longer term the focus will be on breakthrough solutions for further radical advances to assure the transition from fossil to new energy sources. The work will focus by way of priority on research into:

- clean and efficient exploration, production and use of fossil fuels,
- large-scale conversion of energy (electricity and heat),
- increasing new and renewable energy sources and their integration in small-scale supply,
- long-distance transmission and distribution of energy.

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

The efforts will be focused on <sup>(7)</sup>:

- the fight against major natural and technological hazards through the development of forecasting, prevention, impact assessment and mitigation techniques,
- the development of generic earth observation technologies, notably satellite technologies <sup>(8)</sup>, for environmental monitoring and resources and ecosystem management,
- the study of the socioeconomic aspects of environmental change within the perspective of sustainable development (the impact on society, the economy and employment),
- the development of new materials and production technologies in the coal industry <sup>(9)</sup>.

- (c) *Support for research infrastructures*

The priority in this area is to ensure access to and use of, on a Community scale, specialised databases, very powerful computer centres, in particular for climate studies, and marine research facilities.

<sup>(6)</sup> Research activities relating to controlled thermonuclear fusion are described in the proposal for the fifth framework programme of research and training under the Euratom Treaty.

<sup>(7)</sup> Research activities in support of nuclear safety and safeguards are described in the proposal for the fifth framework programme of research and training under the Euratom Treaty.

<sup>(8)</sup> There will be specific coordination of the activities relating to 'space technology' applications carried out within each of the thematic programmes concerned.

<sup>(9)</sup> With the prospect of increasing implementation within the framework programme of activities currently being carried out on the basis of the ECSC Treaty, which expires in 2002.

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## AMENDED PROPOSAL

## SECOND ACTIVITY

## SECOND ACTIVITY

## 1. Confirming the international role of Community research

## I. 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 East European accession candidates, and to help the Community establish industrial cooperation and open up new markets.

The main purposes of this horizontal theme are to promote scientific and technical cooperation internationally, to reinforce Community capacities in the fields of science and technology, to generally support the achievement of scientific excellence within the wider international framework, and to contribute to the implementation of the Community's external policy, in particular with the accession of new Union members in mind.

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:

The general objectives of international scientific cooperation 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'),
- 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 East European countries (CEECs), to support the Euro-Mediterranean partnership, to stabilise the human potential of the CEECs 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.

- to promote scientific and technological cooperation between undertakings, organisations and researchers from third countries and from the Community that is likely to produce significant mutual and balanced benefits, taking into account the different needs and circumstances of individual groups of countries and regions while respecting the protection of the intellectual property rights of participants,
- to facilitate access for research centres and undertakings established in the Community to scientific and technological knowledge available outside the Community and useful to the Community's interests,
- to enhance the position and role of Community research in the international scientific and technological arena and promote a European scientific and technological culture,
- to prepare for the accession of new Member States for example by encouraging their full association with the framework programme; to contribute to the stabilisation of the research and technological development potential of the CEECs in general and of the newly independent States of the former Soviet Union (NIS); to support and develop the Euro-Mediterranean partnership and to contribute to the sustainable economic, social and scientific development of developing countries,
- to help European research players acquire information and gain experience of the research capacities, activities and priorities of industrialised third countries and 'emerging economy' countries, so as to make Community industry more competitive and enhance its presence on new markets.

International scientific and technological cooperation will be implemented 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.

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

## ORIGINAL PROPOSAL

(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 socioeconomic 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 socioeconomic conditions of sustainable development (for example agroindustrial 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.

## AMENDED PROPOSAL

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

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

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

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

– NIS and Central and East European countries not in the pre-accession phase: support for their research and technological development potential; (including through INTAS for the NIS, provided that a new agreement is reached between its members on its continuation), cooperation in areas of mutual interest (including satellite applications, regional problems linked to the environment and health),

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

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

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— 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),

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

(b) *Training of researchers:*

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

(c) *Coordination*

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

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

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

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



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- 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.

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- participation in specific programmes on a project-by-project basis: if a bilateral or a multilateral cooperation agreement is necessary, in the Community's interest, in order to provide access to high-quality third-country programmes and suitable intellectual property rights arrangements, project-by-project participation will be subject to the conclusion of such an agreement. In the case of project-by-project participation, participating entities of third countries will in principle not benefit from funds under these programmes, except in cases duly justified as being in the Community's interest. Measures will be taken to enhance access to the Framework Programme for 'emerging economy' countries.

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

## 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.

## THIRD ACTIVITY

## 1. Innovation and participation of SMEs

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

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

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The general objectives of Community action in this area are:

- to improve the economic and social impact of the 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 in 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,

## ORIGINAL PROPOSAL

- 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.).

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

## 1. General objectives

(a) *Promotion of innovation*

- to help implement innovation policies in the European Union, in particular by contributing to the creation of an environment conducive to innovation,
- to enhance public awareness of the benefits of innovation,
- to improve the economic and social impact of framework programme research activities by ensuring better dissemination and exploitation of their results, as well as the transfer and dissemination of technology from various sources, taking account of the needs of customers and users,
- to facilitate access of programme participants (particularly SMEs), through provision of information and advice, to instruments which support innovation.

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(b) *Encouraging SME participation*

- to stimulate SME participation in the research programmes and technology transfer to SMEs, both SMEs active in research and high technology and those with little or no research capability but with substantial technological needs and a capacity to absorb new technologies; to help SMEs throughout the European Union to develop their technological capabilities, also taking into account specific problems of SMEs in less-favoured regions,
- to assist SMEs in setting up transnational networks and partnerships for the absorption and diffusion of new technologies,
- to encourage the development of transnational links between SMEs, large companies, research centres and universities.

2. **Activities specific to the horizontal programme**(a) *Promotion of innovation*

- identification and dissemination, in concert with the other programmes of the framework programme, of adequate mechanisms to facilitate, in the life-cycle of projects, the exploitation, private financing and transfer of technologies and results produced, while guaranteeing protection of the knowledge acquired,
- development, validation and implementation of methodologies for technology transfer integrating the technological, economic and social aspects of innovation and, where necessary, transnational dissemination and exploitation of results not stemming from the thematic programmes,
- coordination of studies and analyses carried out in various forums and integration of their results, with a view to establishing a common reference framework in the area of innovation policy.

(b) *Encouraging SME participation*

- management of a single complementary entry point for SMEs, for all the research programmes, in the Commission's departments, making use of existing support networks in Member States; definition and management of common tools facilitating SME participation in the programmes (fullest possible use of electronic methods for information dossiers, submission of proposals, 'help line', specialised Intranets to stimulate SME participation in innovation, etc.); provision of information on programmes and training on proposal preparation; increasing involvement of the SMEs concerned in the consultation/assessment process; ensuring a structured and rapid feedback system for all applicants; assistance for the establishment of consortia; establishment of vertical 'innovation networks' which could act as 'virtual centres of excellence' and would include partners involved in development, start-up, management and financing of new products and processes,

## ORIGINAL PROPOSAL

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

(c) *Joint 'innovation/SMEs' actions*

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

- provision of information and advice (as well as pilot activities) in the areas of:

- intellectual property rights,
- access to private finance, notably venture capital funds,
- the creation of innovative firms, principally via European organisations and funds (European Investment Fund, European Investment Bank, and the Eurotech capital scheme).

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

- identification and promotion, in concert with the other programmes of the Framework Programmes, of best practices in innovation.

(b) *Interaction with related actions in the other framework programme activities***3. Interaction with related actions in the other framework programme activities**(i) **For innovation**(a) *Promotion of 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.

- encouraging preparation for the exploitation and dissemination of results during the research phase,
- ensuring consistency between activities to foster innovation under the other programmes and those carried out in this programme,
- coordination of the activities of the 'innovation units' to be set up in the thematic programmes, with the aim of integrating the innovation dimension in the implementation of programmes (e.g. in the selection and monitoring of projects) and securing, as appropriate, the follow-up of technology transfer, including technology transfer projects with a demonstrative effect.

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## (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,

## AMENDED PROPOSAL

(b) *Encouraging SME participation*

Support for SME participation in research and technological development and demonstration activities to be carried out in the framework of other programmes:

- 'cooperative research' activities enabling at least three mutually independent SMEs from at least two Member States to jointly entrust the resolution of their common technological problems to third legal entities with appropriate research capacities,
- activities to support and encourage SME participation in collaborative and cooperative research projects (for example on the basis of 'exploratory awards') respecting the needs of SMEs for a flexible and easily accessible support system.

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

## 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,

## ORIGINAL PROPOSAL

- to encourage better use of research infrastructure,
- to develop the socioeconomic 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.

## AMENDED PROPOSAL

- to encourage better use of research infrastructure,
- to develop the socioeconomic 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,
- to ensure, by the development of specific efforts, equality of access and a better balance between men and women participating in this activity.

(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 mathematical, 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.

## ORIGINAL PROPOSAL

## (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 socioeconomic 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 socioeconomic 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).

## AMENDED PROPOSAL

## (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 socioeconomic 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 socioeconomic impact of the development of services and the 'non-tangible' economy; producing and validating new development models fostering growth, employment, equal opportunities for women and men, 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).



## ANNEX III

**FIFTH FRAMEWORK PROGRAMME (1998 to 2002)**  
**AMOUNTS AND BREAKDOWN**

|  | ECU million<br>(current prices) |
|--|---------------------------------|
| First activity (research, technological development and demonstration programmes)  | 11 775 <sup>(1)</sup>           |
| Second activity (cooperation with third countries and international organisations) | 491 <sup>(1)</sup>              |
| Third activity (dissemination and optimisation of results)                         | 350 <sup>(1)</sup>              |
| Fourth activity (stimulation of the training and mobility of researchers)          | 1 402 <sup>(1)</sup>            |
| Maximum overall amount   | 14 833 <sup>(2)</sup>           |

Indicative breakdown between the themes of the first activity (ECU million):

|  |                       |
|--|-----------------------|
| — improving the quality of life and the management of living resources | 2 650 <sup>(1)</sup>  |
| — creating a user-friendly information society                         | 3 925 <sup>(1)</sup>  |
| — promoting competitive and sustainable growth                         | 3 100 <sup>(1)</sup>  |
| — preserving the ecosystem   | 2 100 <sup>(1)</sup>  |
|  | 11 775 <sup>(1)</sup> |

<sup>(1)</sup> Excluding the amount for JRC direct actions.

<sup>(2)</sup> Of which ECU 815 million for the JRC.

## ORIGINAL PROPOSAL

## AMENDED PROPOSAL

## ANNEX IV

## ANNEX IV

## RULES FOR FINANCIAL PARTICIPATION BY THE COMMUNITY

## 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 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.

The key actions, the research and technological development activities of a generic nature, 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

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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.

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

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(a) *Shared-cost actions*(a) *Shared-cost actions*

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

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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%.

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.

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.

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.

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## ORIGINAL PROPOSAL

## AMENDED PROPOSAL

## — 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 hand enable young Community researchers to spend time in Japan and South Korea.

In the special case of legal entities which do not keep analytical accounts, the additional costs generated as a result of these projects will be financed at the rate of 100%.

## — 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' projects enable at least three mutually independent SMEs from at least two Member States to jointly entrust the resolution of their common technological problems to third legal entities with appropriate research capacities. They are financed up to 50% of the eligible project costs.

'Exploratory awards' allow the exploratory phase of an RTD project to be facilitated. This could consist of feasibility studies, project validation and preparation and partner search, during a period not exceeding 12 months. They are financed up to 75% of the eligible costs of the exploratory phase of an RTD activity.

(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, Mediterranean countries and emerging economy countries to be given an opportunity to spend time in Community laboratories, and on the other hand enable young Community researchers to spend time in industrial laboratories in third countries in areas of special interest to the Community.

## ORIGINAL PROPOSAL

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.

## AMENDED PROPOSAL

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.

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*(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.

## ORIGINAL PROPOSAL

In the Decisions adopting the specific programmes implementing the fifth 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.

## AMENDED PROPOSAL

In the Decisions adopting the specific programmes implementing the fifth 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 and scientific and technical support activities of an institutional character. The JRC may provide support where it has special or even unique facilities in the Community or where it is tasked with activities necessary for the framing and implementation of Community policies and tasks incumbent on the Commission pursuant to the Treaty which require the JRC's impartiality. Community funding will 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.

**Second amended proposal for a Council Decision concerning the fifth framework programme of the European Atomic Energy Community (Euratom) for research and training activities (1998 to 2002) <sup>(1)</sup>**

(98/C 106/02)

(Text with EEA relevance)

COM(98) 8 final – 97/0120(CNS)

*(Submitted by the Commission on 14 January 1998)*

<sup>(1)</sup> OJ C 291, 25.9.1997, p. 16.

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ORIGINAL PROPOSAL

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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,

Having regard to the opinion of the Economic and Social Committee <sup>(2)</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 to 2002, a new framework programme in order to ensure the continuity of research and training activities in the field of nuclear energy;

<sup>(1)</sup> OJ C 173, 7.6.1997, p. 30.

<sup>(2)</sup> OJ C 355, 21.11.1997, p. 38.

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AMENDED PROPOSAL

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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,

Having regard to the opinion of the Economic and Social Committee <sup>(2)</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 to 2002, a new framework programme in order to ensure the continuity of research and training activities in the field of nuclear energy;

<sup>(1)</sup> OJ C 173, 7.6.1997, p. 30, and OJ C 291, 25.9.1997, p. 16.

<sup>(2)</sup> OJ C 355, 21.11.1997, p. 38.

## ORIGINAL PROPOSAL

Whereas, in accordance with Article 4(2) of 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>(3)</sup>, as last amended by Decision 96/253/Euratom <sup>(4)</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>(5)</sup> setting out the preliminary guidelines for the fifth framework programme, stressing the need for the 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>(6)</sup>, which provided more details about the proposed objectives and the implementation mechanisms, and then a second working paper of 12 February 1997 <sup>(7)</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 these types 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;

<sup>(3)</sup> OJ L 115, 6.5.1994, p. 31.

<sup>(4)</sup> OJ L 86, 4.4.1996, p. 72.

<sup>(5)</sup> COM(96)33 final.

<sup>(6)</sup> COM(96)595 final.

<sup>(7)</sup> COM(97)47 final.

## AMENDED PROPOSAL

Whereas, in accordance with Article 4(2) of 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>(3)</sup>, as amended by Decision 96/253/Euratom <sup>(4)</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 setting out the preliminary guidelines for the fifth framework programme <sup>(5)</sup>, stressing the need for the 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>(6)</sup>, which provided more details about the proposed objectives and the implementation mechanisms, and then a second working paper of 12 February 1997 <sup>(7)</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 research and technological development activities of a generic nature, 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;

<sup>(3)</sup> OJ L 115, 6.5.1994, p. 31.

<sup>(4)</sup> OJ L 86, 4.4.1996, p. 72.

<sup>(5)</sup> OJ C 92, 28.3.1996, p. 16.

<sup>(6)</sup> COM(96)595 final.

<sup>(7)</sup> COM(97)47 final.

## ORIGINAL PROPOSAL

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, while 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 within the meaning of 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 abovementioned principles; whereas those criteria should also be applied to the implementation of the fifth framework programme in order to ensure consistency;

## AMENDED PROPOSAL

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, while taking into account the increased efforts by its main international partners in research and training investments; whereas that potential concerns both the physical and non-tangible infrastructures and human resources;

Whereas promoting sustainable growth for Europe's economy and sustainable competitiveness for its industry requires strengthening its science and technology base in the medium or long term.

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 within the meaning of 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 abovementioned principles; whereas those criteria should also be applied to the implementation of the fifth framework programme in order to ensure consistency;



## ORIGINAL PROPOSAL

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>(8)</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;

## AMENDED PROPOSAL

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

Whereas the annual report to be submitted to the Council pursuant to Article 7 of the Treaty will 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>(8)</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 the budgetary authority will make every effort to reach the financial reference amount provided that the financial perspective for the forthcoming period is compatible with the justified requirements of all the other policies;

Whereas the financial reference amount allocated to the fifth framework programme will be revised in the event of the accession of new Member States before the expiry of the framework programme;

Whereas the administrative expenditure arising from the research activities should be financed within the limits of the general amount allocated to the framework programme, and whereas it should, however, be included in the budget in a transparent fashion; whereas the budgetary authority requires of the Commission a detailed, comparable analysis of administrative expenditure and the implementation thereof;

<sup>(8)</sup> OJ C 10, 4.4.1996, p. 4.

<sup>(8)</sup> OJ C 10, 4.4.1996, p. 4.

## ORIGINAL PROPOSAL

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 to 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.

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 to 2002 is ECU 1 467 million <sup>(9)</sup>.

<sup>(9)</sup> Of which ECU 326 million for the JRC.

## AMENDED PROPOSAL

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;

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<sup>(9)</sup> Of which ECU 326 million for the JRC.

## ORIGINAL PROPOSAL

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.

## AMENDED PROPOSAL

If this amount is consistent with the financial perspective for the period 2000 to 2002, it shall be deemed to be confirmed. Otherwise, the annual appropriations allocated by the budgetary authority shall be consistent with the financial perspective for each of the years in that period, in compliance with the priorities set in this Decision.

All the administrative expenditure arising from the research activities shall be paid from the overall amount allocated to the programme. It shall appear in the same way as other comparable administrative expenditure in the Community budget. The Commission shall communicate each year, with the preliminary draft budget, detailed comparable analyses of administrative expenditure and the implementation thereof.

The amount referred to in the first paragraph of this Article may be subject to revision in the event of the accession of new Member States before the expiry of the framework programme.

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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.

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## ORIGINAL PROPOSAL

## AMENDED PROPOSAL

*Article 5**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.

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.

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.

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.

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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.

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*ANNEX I**ANNEX I***CRITERIA FOR SELECTING THE AREAS AND OBJECTIVES****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.

1. 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.

## ORIGINAL PROPOSAL

In pursuit of a cost-benefit approach dictated by concern for optimum allocation of European public funding, the choice of themes for the fifth 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.

## AMENDED PROPOSAL

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

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

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

- need to establish a 'critical mass' in human and financial terms, in particular through the combination of the complementary expertise and resources available in the various Member States,
- significant contribution to the implementation of one or more Euratom 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 are more effectively pursued at the Community level by means of research activities conducted at that level.

*Criteria related to social objectives*

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

in order to further major social objectives of 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 scientific and technological progress are opening up, offering possibilities for dissemination and exploitation of results in the medium or long term,

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

## ORIGINAL PROPOSAL

*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 fifth 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 FIFTH FRAMEWORK PROGRAMME**

1. The fifth framework programme will cover controlled thermonuclear fusion and energy systems related to nuclear fission.

## AMENDED PROPOSAL

3. These criteria will be used, and where necessary supplemented, for the implementation of the fifth framework programme, in order to define the research and training programmes and select the research activities, including demonstration activities, and training activities. The three categories of criteria will apply simultaneously and must all be met, although to a different extent from case to case.

## ANNEX II

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**I. AREAS AND ORGANISATION OF THE FIFTH FRAMEWORK PROGRAMME**

1. The fifth framework programme will cover controlled thermonuclear fusion and energy systems related to nuclear fission.

## ORIGINAL PROPOSAL

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 fifth 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.

## AMENDED PROPOSAL

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,
- research and technological development activities of a generic nature,
- activities in support of research infrastructures.

These activities will, where necessary, comprise studies and research on ethical and legal aspects, within a context of respect for fundamental human values.

Particular account will be taken of the economic and social implications of the implementation, use, and effects of the technologies and processes involved in each of these activities.

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 direct research and training actions to be implemented by the Joint Research Centre (JRC) will comprise research and scientific and technical support activities of an institutional character. The JRC may provide support where it has special or even unique expertise and facilities in the Community or where it is tasked with activities necessary for the framing and implementation of Euratom policies and tasks incumbent on the Commission pursuant to the Treaty which require the JRC's impartiality (for example in the cases of standardisation and the monitoring of the application of certain community policies).

The JRC is also progressively involved in competitive activities.

## ORIGINAL PROPOSAL

## 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 socioeconomic 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.

<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 fifth European Community framework programme for research and technological development.

## AMENDED PROPOSAL

## II. SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES

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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, including coordination of national civil research into inertial confinement in addition to magnetic confinement, in the context of technology watch,
- 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 socioeconomic aspects; dissemination of results and the diffusion of information to the public.

<sup>(1)</sup> This activity supplements the key actions relating to energy in the proposal for the fifth European Community framework programme for research and technological development.



## ORIGINAL PROPOSAL

(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,
- 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.

<sup>(2)</sup> This research supplements, in the field of nuclear energy, the activities for the research and development of technologies in the thematic programme ‘Promoting competitive and sustainable growth’ of the proposal for the fifth EC framework programme.

## AMENDED PROPOSAL

(b) *Research and technological development activities of a generic nature* <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, in particular through the transmutation of long-lived isotopes into short-lived isotopes,
- 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 existing and new nuclear reactors, waste management in these countries, radiation protection, including the repairing of the damage caused by accidents, 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,
- technical contributions in the context of cooperation with the International Atomic Energy Agency (Vienna).

<sup>(2)</sup> This research supplements in the field of nuclear energy the research and technological activities of a generic nature in the thematic programme ‘Preserving the ecosystem’ of the proposal for the fifth EC framework 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.

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## 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 eligible costs generated as a result of the research will be financed at the rate of 100%.

## ANNEX III

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The key action, the research and development activities of a generic nature, 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 RDT actions and direct RDT actions.

**1. Indirect RDT actions**

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

*(a) Shared-cost actions*

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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.

## ORIGINAL PROPOSAL

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 fellowship 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.

## AMENDED PROPOSAL

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.

In the special case of legal entities which do not keep analytical accounts, the additional eligible costs generated as a result of these projects will be financed at the rate of 100%.

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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.

## ORIGINAL PROPOSAL

*(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 fifth 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.

## AMENDED PROPOSAL

*(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 RDT 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.

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**ORIGINAL PROPOSAL**

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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 RTDT 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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**AMENDED PROPOSAL**

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

**2. Direct RDT actions**

The direct RDT actions to be implemented by the Joint Research Centre (JRC) will comprise research and scientific and technical support activities of an institutional character. The JRC may provide support where it has special or even unique expertise and facilities in the Community or where it is tasked with activities necessary for the framing and implementation of Euratom policies and tasks incumbent on the Commission pursuant to the Treaty which require the JRC's impartiality. The Community funding will be 100% of the costs of the direct RDT 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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