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**COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE  
EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND  
THE COMMITTEE OF THE REGIONS**

**Making a reality of The European Research Area: Guidelines for EU research activities  
(2002-2006)**

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## A NEW HORIZON

The *European Research Area* project offers a new horizon for scientific and technological activity and for research policy in Europe.

The aim is to create conditions making it possible to increase the impact of European research efforts by strengthening the coherence of research activities and policies conducted in Europe.

Another objective is to lay the foundations for a new contract between European citizens and science and technology by putting research back at the heart of society and subjecting its applications to informed political debate, as befits their social implications.

In the early 1980s voices were raised at national and European level warning against the risk of Europe falling behind the United States in the major fields of the third industrial revolution.

Nearly 20 years on, research is proving to be a central component of the new economy and knowledge-based society developing worldwide. More than ever before it is one of the basic driving forces behind economic and social progress and a key factor in business competitiveness, employment and the quality of life. Science and technology are also central to the policy-making process.

However, Europe is still suffering from structural weaknesses where research is concerned. In 1999 the EU invested EUR 70 billion less than the United States in research and development. It now lags behind the US and Japan in terms of research spending as a proportion of GDP (1.8% compared with 2.7% and 3.1% respectively), but also in terms of the number of researchers, the number of patents and high-technology exports per capita.

Research will need to play an even stronger and more central role in the workings of Europe's economy and society. This will necessitate stepping up public and private sector research efforts in the EU, and in addition the co-ordination of Member States' research efforts, and co-ordination between the research conducted at national and EU level.

In addition, Europe's citizens need to be given the means to fully regain the enthusiasm for the adventure of knowledge that they have displayed at other times in their history, and create a climate of well-justified confidence in technological progress.

### **THE EUROPEAN RESEARCH AREA PROJECT**

Against this background, in January 2000 the Commission proposed the creation of a *European Research Area*<sup>1</sup>.

At the Lisbon European Council on 23-24 March the Heads of State and Government fully endorsed this project as a central component of the establishment of a European knowledge-based society.

In order to carry it through in the context of an "open method of co-ordination" they set a series of objectives and an implementation timetable.

Following on from the Conclusions of the European Council, the Resolution adopted at the Research Council on 15 June 2000 calls upon the Member States and the Commission to take the necessary steps to make a start on realising this Area.

Meanwhile, the European Parliament had strongly supported the project in a Resolution adopted on 18 May 2000.

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<sup>1</sup> COM (2000)6

The idea of a *European Research Area* has also been welcomed by the Economic and Social Committee and the Committee of the Regions, as well as by the candidate countries, which are already associated with the EU's Research Framework Programme and will be fully associated with this initiative dynamically supporting the process of enlargement.

It has been warmly welcomed by the scientific community and industry; several hundred companies, research bodies and individual researchers have sent in their comments, either spontaneously or in response to a wide-ranging consultation. The results of this have been placed on the Internet-site "Towards a European Research Area"<sup>2</sup> where they can be consulted.

**Making a reality of the *European Research Area* will necessarily be the product of a joint effort by the EU, its Member States and research stakeholders.**

The globalisation of the economy and communications, the acceleration of scientific and technological progress and its many social implications make the *European Research Area* an objective which cannot be postponed.

It will require first of all a number of initiatives, notably on legal and regulatory issues, and in particular measures to remove the obstacles to the free movement of researchers, knowledge and technologies in Europe in different areas: scientific careers, social protection and intellectual property systems, and provisions concerning the transfer of knowledge and dissemination of results.

In the months ahead the Commission will be putting forward analyses and, where appropriate, proposals in these various areas, on the basis of evaluations carried out in conjunction with the Member States.

Alongside initiatives of this kind, financial measures in support of EU research will have an important role to play. This Communication concerns more specifically these support measures and the shape that they should take in the future.

However, this Communication does not contain any indication of a financial character, nor regarding the necessary human resources, as such indications should be provided when the formal proposals for the future Framework Programme and its specific programmes are presented.

#### **REASSESSING EU RESEARCH SUPPORT MEASURES**

Given the objectives of the *European Research Area* project, there is a need to reassess the shape and content of EU research activities.

Future measures in support of EU research will have to take into account European needs in this area in all their various aspects: the need for competitiveness as well as to live up to the citizen's expectations; the need to promote excellence as well as for balanced and coherent technological development in the EU as a whole; and needs relating more particularly to the definition, implementation and follow-up of EU policies.

But also, and above all, they must be designed to exert a more "structuring" effect on European research than is the case at present.

Supplementing the European intergovernmental scientific co-operation initiatives launched since the 1950s, the EU's Framework Programmes have made a significant contribution to strengthening European research capabilities.

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<sup>2</sup> <http://europa.eu.int/comm/research/area.html>

The collaboration networks and the forms of co-operation to which they have given rise (250,000 transnational co-operational links between 1995 and 1999) represent a considerable achievement.

Generally, however, these Framework Programmes have up to now to a large extent been additional to 15 series of national programmes conducted independently of one another.

In order to be able to play a more structuring role in support of the realisation of the *European Research Area*, they need to be more closely linked with national activities and European intergovernmental co-operation initiatives. Their funding should be combined to a greater extent with other public and private sector funding.

**The *European Research Area* project requires the full application of the principle, enshrined in the Treaty, of complementarity between EU research activities and Member States' research activities.**

New instruments and new methods of intervention need to be conceived and used for this purpose, specifically designed to help correct the structural weaknesses of European research.

The purpose of this paper is to propose guidelines for future measures in support of EU research, and more specifically the research Framework Programme, for the period 2002-2006. In addition, this paper contains the Commission's mid-term review of the 5<sup>th</sup> research Framework Programme. In this respect, it also constitutes the mid-term Communication provided for in Article 6 of the Decisions n°182/1999/EC and n° 1999/64/ Euratom on the Fifth Framework Programme.

**Presenting these guidelines will set in motion a process resulting in an in-depth discussion of the mechanisms envisaged, as well as a debate about priorities.**

# BROAD LINES AND OBJECTIVES

Future measures in support of EU research should be designed with reference to the broad lines of the *European Research Area*.

The latter needs to be realised if the EU is to attain in full the objectives of research and technological development policy as set out in the Treaty: strengthen the scientific and technological bases of Community industry and encourage it to become more competitive at international level; promote the research activities deemed necessary by virtue of other EU policies.

This implies action in a number of areas, the first of which (various forms of support for research activities in their strict sense) should account for a substantial proportion of EU efforts.

## 1. OBJECTIVES

The following objectives, presented in a thematic order that does not prejudice either the structure of the future Framework Programme or how it will implement the four categories of activities provided for in Title XVII of the Treaty, would be pursued in these various areas:

– **Research activities :**

Improving the performance of European research, in particular through the networking and coordinated implementation of national programmes; networking centres and areas of excellence in the public (in particular university) and private sectors in the Member States; carrying out large-scale targeted research projects, particularly in the field of industrial research.

– **Research and innovation, "start-ups" and SMEs:**

Strengthening technological innovation capacities in the EU, in particular by supporting research for and in SMEs, dissemination, transfer and take-up of knowledge and technologies, exploitation of research results and setting-up of technology businesses;

– **Research infrastructure:**

Strengthening the European research infrastructure by implementing a European policy in this area, taking into account questions concerning access, operation and construction, and also covering the question of large-capacity electronic networks for research.

– **Human resources:**

In support of the development of a knowledge-based economy, strengthening Europe's human resources in science, technology and innovation, in particular by increasing transfrontier mobility, developing European careers, increasing the participation of women in research and making the scientific professions more attractive to young people and Europe more attractive to researchers from third countries.

– **Science, society and citizens:**

Establishing, on a European scale, a new contract between science and society by strengthening the link between research activities and policies and the needs of society, taking greater account of the needs relating to the application of the precautionary principle and the sustainable development principle, as well as the social and ethical consequences of scientific and technological progress

## 2. THREE ASPECTS TO BE TAKEN INTO ACCOUNT

Three specific aspects should be taken into account with regard to measures taken in these areas:

- Firstly, the overall coherence of **European scientific and technological cooperation**. The objective here is to increase the impact of European cooperation initiatives through:
  - better coordination of the activities of the various organisations and between those activities and EU activities;
  - more systematic use of the possibilities for joint or converging measures.
- Secondly, the **regional dimension**. EU measures should be designed in such a way as to encourage:
  - full use of the dynamic and potential of the regions by networking their capacities and activities with regard to research, innovation and technology transfer, especially where they are confronted with common problems;
  - the taking into account of regional, geographical or economic specificities in the carrying-out of research activities in Europe.
- Thirdly, the **international dimension**. With its mission to fully integrate the countries applying for accessions, the *European Research Area* is also outward-looking. The following objectives should be pursued:
  - implement cooperation enabling European researchers and industry to have access to knowledge and technologies produced elsewhere in the world;
  - mobilise the EU's scientific and technological capacities for the benefit of the international community and its relations with its partner countries in areas in which Europe has recognised expertise.

To attain these objectives it will in particular be necessary to include cooperation agreements or specific conventions in certain areas (for example, the fight against major illnesses, particularly in the developing countries, or advanced materials).

These three aspects should be taken into account in particular by efforts to implement joint measures with those of the *European Research Area*, or measures complementing activities in its main fields, in the spheres of action of:

- European intergovernmental scientific cooperation structures and organisations:
  - of a general nature, such as the European Science Foundation, COST and EUREKA;

- of a specialised nature, such as in particular ESA, EMBL, ESRF and CERN<sup>3</sup>;
- the Structural Funds, regional initiatives and European Investment Bank activities;
- the programmes of economic and technical assistance to the Central and Eastern European countries and Mediterranean third countries, and the other financial instruments of international cooperation.

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<sup>3</sup> ESA: European Space Agency; EMBL: European Molecular Biology Laboratory; ESRF: European Synchrotron Radiation Facility; CERN: European Organisation for Nuclear Research.

# SELECTION CRITERIA AND PRIORITIES

## 1 CRITERIA

European research efforts should be focused on a more limited number of priorities which should be the subject to a political choice on the basis of objective assessment criteria.

There are two aspects to the question of selecting and justifying EU research activities.

First and foremost, public funding itself requires justification. Public authorities can legitimately support research activities where the results generated are of “public benefit” in addition to the direct benefit for whoever is carrying out the research.

This is the case with basic research, but also with many examples of targeted research.

Public funding is legitimate and necessary where research in question may make a contribution to, or is essential for, the implementation of public policies. This is also true where it helps to resolve problems confronting society and increases European competitiveness, by encouraging businesses to carry out risky or long-term research which is not immediately cost-effective, and where it helps to increase the transparency of the knowledge market.

The second aspect is the justification for support at European level, and more particularly at Community level. The key concept here is that of **European added value**.

European added value is first and foremost connected with the specific form that EU research activities must take activities which in accordance with the Treaty are designed to complement Member States’ activities.

However, the principle of European added value also has to be the basic criterion for selecting priorities and themes for EU research activities.

In the past a list of criteria enshrining this principle has been drawn up on several occasions in different forms, in particular in the Decisions adopting the earlier Framework Programmes. It covers the following aspects:

- cost and scale of research above and beyond the possibilities of a single country, and the need to assemble a critical mass of financial and human resources;
- importance in economic terms of working jointly (economies of scale) with beneficial effects on private-sector research and industrial competitiveness as a result;
- need to combine complementary expertise in the different countries, particularly in the case of interdisciplinary issues, and to carry out comparative studies on a European scale;
- links with EU priorities and interests and with Community legislation and policies, in particular in the fields of enterprise, the information society, agriculture, environment, energy, transport, health and consumers, employment and social affairs, education, justice and internal affairs, as well as external relations, trade and development;
- the necessarily trans-national nature of the research, given the scale on which the issues arise (environment) or for scientific reasons (comparative studies, epidemiology).

## 1 PRIORITIES

Applying these criteria at a general level could, for example, result in taking into consideration as possible priorities areas such as:

- “post-genome” research and research into major illnesses, given the scale and complexity of the task and the need for Europe to provide a coherent contribution to international efforts in this area;
- nanotechnologies, an interdisciplinary research field with many applications and implications;
- the research needed to develop the information society, particularly in conjunction with the e-Europe initiative;
- research and development work that one country or one firm alone could not carry out, in the aeronautical and space<sup>4</sup> sectors where there is considerable world competition;
- research supporting European policymaking in areas characterised by the presence of strong uncertainties and risks (including the implementation of the precaution principle);
- research in support of Community policies needed to implement a sustainable development model in the broadest sense.

However, these are just examples of very broadly defined themes and fields. For each of the priorities selected it will be necessary to apply more selective criteria, endeavouring:

- to use them not solely to include, but also to exclude seeking to demonstrate not just that a topic should be addressed at European level but that it cannot be more effectively addressed at national level;
- to use them to rank priorities in light of the objectives set.

A method of this kind should make it possible to select the specific activities to be embarked upon in the various fields of the *European Research Area*.

Along the lines of the key actions of the 5th Framework Programme, the various priorities should give rise to initiatives combining measures of various kinds in several areas (various forms of research activities, innovation, infrastructure, human resources, etc.).

Support for research activities (participation in the joint implementation of national programmes, networks of excellence and large-scale targeted research projects) would focus on priority themes grouped by main areas. A limited level of resources should, however, be set aside to deal with important specific needs outside these areas or connected with several of them.

A greater flexibility in the internal allocation of resources would allow unforeseen needs arising during the execution of programmes to be tackled.

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<sup>4</sup> In the latter case, in accordance with the guidelines set out in the Communication "*Europe and Space*", COM(2000)597.

While satisfying the criteria for European added value, measures concerning infrastructures, human resources, technological innovation, and the various aspects of issues concerning science, society and citizens will not be limited to the priority thematic areas.

# ANALYSIS OF PAST AND CURRENT ACTIVITIES

In the run-up to the next Framework Programme, several exercises have been carried out in recent months to analyse past and current activities. Their conclusions and the messages emanating from them broadly concur.

## 1. THE OPINION OF THE INDEPENDENT EXPERT PANEL

Based on its own analyses and the conclusions of the reports assessing the different programmes, a panel of eleven independent experts assessed the implementation of the Framework Programme over the last five years and the results achieved.<sup>5</sup>

In general, the panel stresses:

- the need to place EU research activities in the broader context of a genuine European research policy;
- the role that the Commission can play to facilitate the emergence of coherent science and technology and innovation policies, in particular in the perspective of enlargement.

As far as the past is concerned, the experts note:

- the beneficial impact of concentrating the Framework Programme on collaborative research projects many of which "*would not have been possible without the Framework Programme*" and which "*fill a gap in Europe by enabling academic and industrial researchers to carry out applied work together*";
- the recurring administrative problems that are still apparent today despite all the efforts made to resolve them, and the need to "*reassess the Framework Programme's management structures and procedures*".

As far as the future is concerned, they recommend:

- maintaining the emphasis of the Union's research activities on objectives that are economically and socially relevant, and continuing to use the "key action" concept as a means of focusing the programmes;
- increasing the emphasis on the research needed to achieve the objectives of EU policies;
- maintaining and reinforcing the emphasis on excellence, in particular by offering the best European scientists a framework for conducting leading-edge research that is "riskier" but has a potentially greater benefit;
- a shift towards greater flexibility, by making better use of the range of instruments and possibilities offered by the Treaty.

## 2. THE COMMISSION'S ASSESSMENT

As provided for in the Decision adopting the Framework Programme, the Commission has carried out a mid-term review of its implementation.

It did so in the light of its own observations on the implementation of the 5th Framework Programme (supported by the 1999 "annual monitoring reports") and :

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<sup>5</sup> Five-year assessment of the European Union research and technological development programmes, *Report of the Independent Expert Panel chaired by Jean Majo*.

- the opinions of the European Parliament, the Economic and Social Committee and the Committee of the Regions; and
- the debate in the Council and in the Member States (for example, Senator Laffitte's report for the French Parliamentary Office for the assessment of science and technology options).

The Commission's overall assessment is as follows:

- EU research activities are reaching the limits of what can be achieved with them in their present form. The Framework Programme should therefore be revamped in terms both of its design and of how it is implemented.
- New types of intervention and new mechanisms should be developed with a view to increasing flexibility and speed of implementation while retaining "the best of the past" (principle of collaborative research; peer review; support for other EU policies).
- To enable the Framework Programme to play its role in the development of the *European Research Area*, a stronger link should be established with national activities, in particular by exploiting the various possibilities offered by the Treaty.
- With a view to enhancing effectiveness, the EU's research effort should focus on a limited number of priorities and objectives which can only be addressed at European level through activities of a critical size.
- In setting these priorities and objectives, full account should be taken of the major scientific, industrial, economic and social changes that have occurred since the 5th Framework Programme was being prepared, in particular the development of the new virtual economy and the proliferation of problems (for example of nutritional and industrial security or with respect to the environment,) calling into question public accountability.
- New means are needed to implement EU research activities given the scale that they have now reached and in order to enable the Commission to refocus on its essential tasks of policy formulation, submission of proposals, analysis and monitoring.

These principles should guide the preparation and implementation of the next Framework Programme.

## INSTRUMENTS AND METHODS OF INTERVENTION

The EU's research programmes have so far mainly been implemented through projects on a small scale (EU contribution of EUR 700 000 on average for the 4th Framework Programme; EUR 1.7 million for the 5th Framework Programme) and of short duration (3 years on average).

These projects have always been selected by the Commission following public calls for proposals. The aim of making a reality of the *European Research Area* entails envisaging other ways of applying this principle and new methods of intervention.

Far from sufficing in themselves, the European research programmes need to be designed and implemented in a perspective of close cooperation between the Member States and the EU.

Adapting the instruments of the Framework Programme to the objectives of the *European Research Area* in fact presupposes several concomitant developments:

- moving from an approach based on individual projects to a broader approach, implemented through mechanism of a coherent group of activities with, in some cases, overall financing plans, and in which the EU contribution would represent only part of a much broader whole;
- moving towards more "structuring" and longer-term schemes (in excess of four years) based on forms of support mid-way between support for projects, as given at present, and permanent "institutionalised" financing;
- expanding certain EU schemes in their present form (concerning mobility, for example, or infrastructures) to a level making it possible to increase their impact and exert a greater leverage effect on national initiatives;
- use of "variable geometry" instruments mentioned in the Treaty but not yet exploited, in order to achieve flexibility at the level of entire programmes.

The range of instruments and methods of intervention must be designed in such a way as to take into account the needs of public research systems and the private sector, basic research, targeted research and industrial research, as well as the various aspects of the European research infrastructure in the broadest sense. It would also be applied in fields of research connected with the needs of policymaking and in social and human sciences connected with the economic and social objectives set.

Using this range of instruments, within the limits of available financial resources would also have the effect of substantially increasing the scale of the activities funded by the EU while simplifying and streamlining the administrative procedures.

The instruments in question could take the following form:

### 1. RESEARCH ACTIVITIES:

#### – Networking of national programmes:

This would be achieved by means of two types of action, with different degrees of intensity:

- continuing and enhancing the mutual opening-up of national programmes of Member States with support from the Commission in the context of the open method of coordination advocated by the Lisbon European Council of 23-24 March;
- coordinated implementation of national programmes.

- This possibility, which would have greater integration effects, would be encouraged by making use of the opportunity provided for in Article 169 of the Treaty whereby the EU can participate in research programmes undertaken by several Member States.
  - This formula would be applied in areas and on themes deemed to have priority. The national programmes involved would be implemented by means of joint or coordinated calls for proposals.
  - The Union would bear at least the costs of coordinated implementation of the programmes. Its financial contribution would be greater where the programmes are also open to participation by teams and institutions in other EU countries or associated countries, at a level to be determined.
  - In the preparation of measures of this type, account should be taken of existing collaboration schemes or those in preparation<sup>6</sup>.
- **Networks of excellence:**
- Networking capabilities for excellence in the public (in particular university teams) and private-sector centres of excellence would be achieved with long-term joint programmes of activities. These programmes, representing an order of magnitude of several tens of millions of euros and with a duration longer than that of the current research projects, would entail in particular:
- adopting a joint work programme in a field representing a substantial proportion or all of the activities of the entities concerned, ensuring that the activities complement one another and that there is a precise division of tasks;
  - a minimum level of staff exchanges, over sufficiently long periods, between the various institutions involved;
  - intensive use of computer tools and electronic networks, and development of interactive working methods.
- The networks of excellence would be thematic, disciplinary and, in many cases, interdisciplinary, with many developments taking place at the border-line between particular fields. They would in particular serve as a framework for basic or generic research activities, and when appropriate "risky" research, which would not be carried out with a view to achieving pre-determined results.
- **Large-scale targeted research projects:**
- These projects, with an order of magnitude of several tens to several hundreds of millions of euros, and carried out on certain aspects of selected priority themes, would be carried out by consortia of companies, universities and research centres on the basis of pre-established overall financing plans. The priorities selected and the composition of the consortia would be defined on the basis of transparent rules (involving peer review where appropriate).
- Unlike the previous case, EU intervention would be linked to a commitment to get a result in terms of technological achievements and economic and social impact. It

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<sup>6</sup> For example the European Science Foundation's EUROCORES collaboration scheme now in preparation.

would represent a variable proportion of the total cost depending on the features of the project.

In certain cases, these major projects could be based on the "clustering" of separate components. In the case of industrial research activities, they could take the form of technological platforms, instruments integrating various technologies and their validation, in particular in the form of prototypes. Their design would be encouraged as parts of larger entities which could also benefit from the support of the EUREKA initiative, more specifically for the near-market aspects.

## **2. RESEARCH AND INNOVATION, "START-UPS" AND SMEs**

In accordance with the guidelines set out in the Communication "*Innovation in a knowledge-based society*"<sup>7</sup>, greater European backing for regional and national efforts in support of technological innovation, the dissemination and exploitation of knowledge and results, research for and in SMEs and the setting-up of technology companies could be provided in the following ways:

- "Collective research" activities in the form of support for research carried out in association by national or regional technical research centres for the benefit of European industrial associations or groups of national associations on themes of interest to very many SMEs in all the Member States. To these initiatives could be added new forms of "cooperative research" activities meeting the needs of a limited number of SMEs in different European countries.
- Stepping up technological and economic intelligence activities: collection, processing and dissemination of information of interest to SMEs, e.g. on market trends and technological developments;
- Activities in support of initiatives to network researchers, entrepreneurs and financiers as well as support for the creation of spin-offs from universities and the development of incubators for technology companies.

As far as possible, the initiatives concerned should be implemented in the context of overall action plans involving, depending on the case, financing by companies and industrial associations, national innovation programmes and the European Investment Bank and EUREKA.

## **3. RESEARCH INFRASTRUCTURES:**

EU support for research infrastructures would be increased and diversified.

The EU at present provides specific support for transnational access to certain infrastructures used in the EU. This support could be stepped up and extended to include other aspects of activities carried out with regard to infrastructures existing in the Member States providing services on a European scale in the context of association agreements drawn up for a certain duration between them and the Community.

In the case of new infrastructures of European interest that it is judged necessary to create in the EU, the latter could bear a limited proportion of the development and construction costs, e.g. by co-financing feasibility studies.

It would necessarily do so in the context of financing schemes which combine funds of national and regional origin, from the European Investment Bank, the Structural Funds, from user companies and from private foundations.

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<sup>7</sup> COM (2000) 567.

The same type of approach should be pursued to support the development and use by the different scientific communities of high-speed electronic networks for research.

#### **4. HUMAN RESOURCES**

On account of the particular importance of this aspect as regards realising the *European Research Area*, a substantial increase should be envisaged in the volume of mobility grants for researchers in the EU countries, candidate countries and third countries.

In addition to initial and continuous training needs, action in support of mobility should take into account other categories of needs. A system of grants for the transfer of knowledge and technologies, in particular to SMEs, could thus be set up.

Various initiatives should also be launched to stimulate the development of employment in science and technology in Europe. Measures to encourage the participation of women at all levels in scientific careers should be stepped up. And specific measures should be launched to encourage young people to take up scientific studies and join the world of research.

Efforts will be made to support the development of the expertise and skills needed in a knowledge-based society.

To help Europe maintain its position at the forefront of knowledge, in particular in emerging fields, a support scheme could also be set up for leading-edge teams, for example built around eminent scientists, and for speculative research projects carried out on the basis of small-scale partnerships.

#### **5. SCIENCE, SOCIETY AND CITIZENS**

Under this heading a series of activities would be carried out more specifically intended in particular following the conclusion of the European Council in Lisbon on 23 and 24 March to tailor research activities and policies more closely to the needs of society, and take into account the social consequences of scientific and technological progress.

These activities, using, where necessary, the various instruments and methods of intervention mentioned above, may be grouped together under the following themes:

##### **Support for policymaking and European scientific reference system:**

- Activities in support of policymaking, and more particularly the application of the precautionary principle and the sustainable development principle, as well as, in this context, the development of a European scientific reference system: specific research; validation, testing and pre-normative activities; development of anticipation and warning capacities; organisation of expertise, initiatives to involve stakeholders; actions to disseminate information and knowledge.
- These activities would be carried out by networks of national research bodies or specialised institutions in the Member States, involving the Joint Research Centre in its specific areas of competence.
- They would also be carried out in liaison with those of the future "European Food Authority".

##### **Research and the needs of society:**

Research activities in the economic, social and human sciences on themes of European interest and issues arising on a European scale. Concerted foresight and analysis work, "observatories" for research policies and technological risk.

– **"Science/society" dialogue:**

Initiatives to bring into contact researchers, industry, policymakers and citizens ("Citizens' Conferences" on a European scale, etc.). Initiatives to promote the public's knowledge of science and technology: support for collaboration between museums and centres for scientific culture, schools, television stations, magazines and publishers; "European Science Week".

– **Women and science :**

Stepping up the efforts to increase the participation of women in European research by improving knowledge of the underlying causes of their under-representation in this field and removing obstacles to their participation, as well as the measures taken to ensure that greater account is taken of the specific needs of women and the "gender" dimension in national and Community research activities

– **Ethics:**

Specific research and networking of national institutions and activities in this field.

## MEANS OF IMPLEMENTATION

The implementation of the Union's research programmes is based on a number of fundamental principles which guarantee the quality of the research carried out with EU support and the credibility of what the EU is doing in this area. In particular, projects are selected on the basis of public calls for proposals and evaluation is based on peer review.

These principles should be largely maintained. However, in some cases, the way in which they are applied today will need to be adapted. The activities relating to networks of excellence, large-scale targeted research and infrastructure projects could, for example, be the subject of competitive tendering or calls for proposals different from the traditional calls for research proposals.

Two categories of reasons determine the development of how the EU's research programmes are managed.

First of all, new management methods will naturally flow from the new methods of intervention proposed. The nature of the activities envisaged in several fields, for example, gives rise to the idea of large-scale blocks of activities being carried out by research actors in a technically autonomous manner. This is the case in particular with:

- "programmes of activities" connected with the operation of the networks of excellence;
- large-scale targeted research projects;
- "collective research" projects carried out for the benefit of many SMEs;
- activities relating to research infrastructures carried out in the context of association agreements with the Community;
- mobility grants allocated through the host fellowship scheme whereby research centres, universities or companies are allocated a certain number of fellowships to be awarded and administered independently on the basis of pre-established criteria.

The activities carried out in the context of national programmes executed in a coordinated fashion with EU participation would by definition be managed in the context of those programmes with the Member States and the Commission being jointly responsible for monitoring of their implementation.

Quite apart from the consequences of implementing the *European Research Area* project, a series of considerations militate in favour of externalising certain implementation tasks at present performed by the Commission, in line with its general policy in this area.

These concern, on the one hand, the limits to what EU activities can achieve in their present form and context (highlighted in the various assessment reports); and on the other, the imperative need for the Commission to refocus on its essential tasks, which is one of the central elements of the reform of the Commission that is currently in progress.

Accordingly, the management of any "cooperative research" activities for SMEs, and of "individual" fellowships, could be entrusted to specialised Community public structures of the "implementing agencies" type.

As regards the Joint Research Centre, in accordance with its new mission statement and the conclusions of the Evaluation Report on it produced by the "Davignon Panel", its efforts will focus on activities in scientific and technical support of the implementation of Community policies and European policymaking.

These activities should be in fields in which the JRC, networking to a greater extent with national and private-sector organisations, can contribute the greatest possible European added value on account of its expertise and its institutional status.

## THE NEXT STAGES

The guidelines set out above concerning the objectives, priorities, criteria, instruments and means of implementation for future EU research activities have been formulated on the basis of the objective of contributing, in combination with other EU activities and other European or national initiatives, to making a reality of the *European Research Area*.

They entail initiatives on several levels and in several fields. Proposals and/or analyses (Commission Communications or working papers which do not address budgetary aspects) will shortly be presented on the following themes:

- more or less in parallel with this guidelines paper:
  - a European space strategy;
  - benchmarking methodology and indicators (working paper);
  - science, society and citizens.
- by 31 December 2000:
  - research infrastructures;
  - mapping of excellence (working paper);
- in the first half of 2001:
  - human resources and mobility;
  - regional dimension;
  - opening up to the rest of the world.

More specifically with regard to measures in support of EU research, the first steps have been or will shortly be taken to adapt the activities in progress to the guidelines for the *European Research Area* within the limits of what is possible in the context of the existing programmes.

For the immediate future, steps will be taken under the 5th Framework Programme to simplify the procedures and increase significantly the size of projects by raising the financial thresholds. The Commission will examine the current legal set-up in view of simplification and of the possible use of flat-rate results related financing.

As far as the short term is concerned, measures include:

- The forthcoming amendment of the "work programmes" of several research programmes to make room for measures to stimulate the use of large-capacity electronic networks by the various scientific communities, in particular on the basis of the GRID concept of high-performance distributed computing.
- The proposed application in several programmes of the "integrated project" concept based on the "clustering" of research projects, coordination activities and training fellowships as part of a coherent whole.
- The announced launching of an initiative on the theme of "genomics", involving the launching of a small number of "integrated projects" and an additional effort in relation to research infrastructures, as well as activities in the fields of nanotechnologies and action to combat major illnesses, in an international context.

In the medium term, pilot experiments to network centres of excellence could be initiated in certain priority fields on the scale allowed by the 5th Framework Programme.

However, only with the next Framework Programme will it be possible for the objectives of the *European Research Area* to be fully reflected in EU activities.

As pointed out at the beginning of this communication, these guidelines are being presented to set in motion a process that will continue and develop in the months ahead.

The changes to EU research policy implicit in these guidelines must be the subject of *ex-ante* evaluation work of which this Communication is both the first product and a component part.

They should also, and above all, give rise to an in-depth debate.

Discussion should start rapidly in the European Parliament and the Council and between the Member States and the Commission.

There is also a need to engage in concertation with the candidate countries, which will be fully associated with the next Framework Programme, just as they are with the current one.

The measures envisaged to implement the next Framework Programme can do a lot to help develop a genuine partnership between the EU and the Member States, but they must necessarily be preceded by intensive joint preparatory work.

The latter should already be very advanced by the time that the Commission submits its formal proposal for the Framework Programme in the first quarter of 2001 facilitating in this way the legal decision making.

Creating a *European Research Area* will have many beneficial effects for the EU and its Member States, the scientific community, industry and European citizens. To bring it about will require a coordinated effort by all concerned. This can only be done effectively on the basis of a conclusive debate on the objectives set and the means of attaining them.