

# COMMISSION OF THE EUROPEAN COMMUNITIES

COM(89) 397 final

Brussels, 28 August 1989

Proposal for a  
COUNCIL DECISION

concerning the framework programme of Community activities  
in the field of research and technological development  
(1990-1994)

---

(presented by the Commission)

# COMMISSION OF THE EUROPEAN COMMUNITIES

CORRIGENDUM AU DOC.  
COM(89)397 final DU:  
28/08/89, CONCERNE:  
FR-IT-NE-EN-DK-GR-ESP-

COM (89) 397 final /2

Brussels, 6 October 1989

Proposal for a  
COUNCIL DECISION

concerning the framework programme of Community activities  
in the field of research and technological development  
(1990-1994)

---

(presented by the Commission)

Correction of the 2nd article, first sentence

Old version :

The third framework programme shall be implemented through specific programmes in accordance with Articles 130k and 130p of the Treaty, covering each of the areas referred to in Article 1(2).

Corrected version :

The third framework programme shall be implemented through specific programmes, in accordance with Articles 130k and 130p of the Treaty, covering the areas referred to in Article 1(2).

com 3991

**CONTENTS**

|  | <u>Page</u> |
|--|-------------|
| <b>Foreword</b>  | <b>3</b>    |
| <b>Proposal for a Council decision concerning the framework programme of Community activities in the field of research and technological development (1990-1994)</b> | <b>9</b>    |
| <b>ANNEX I</b>   | <b>19</b>   |
| <b>Breakdown of the amount deemed necessary</b>  |             |
| <b>ANNEX II</b>  | <b>29</b>   |
| <b>The activities</b>  |             |
| <b>Financial Statement</b>   | <b>31</b>   |

### Foreword

1. In submitting the present proposal for a Council decision, the Commission recommends the adoption of a new framework programme, 1990-1994, for Community research and technological development activities.

This framework programme is the third in a series which started with the 1984-1987 framework programme, and was followed by the second which covers the period 1987-1991.

The latter is currently being implemented. For two years the 1990-1994 framework programme will have activities in common with the existing framework programme, according to a rolling programme formula.

2. The immediate past history of the current proposal is the mid-term review of the framework programme in operation, carried out by the Commission on the basis of Article 4 of the Council Decision of 28 September 1987.

This review gave rise to analyses and studies, in particular the First Report on the State of Science and Technology (December 1988) and the evaluation report drawn up by five independent experts (June 1989). This work provided input for the deliberations of the Commission and the Council, which debated possible options and directions for Community activity linked to the framework programme in its meetings on 14 March and 20 June.

3. In the light of this analysis and debate, the Commission has opted for a new five-year framework programme and not a simple revision of the current framework programme which would be limited to the years 1990-1991 and would make the essential strategic adjustments more difficult.

4. This choice by the Commission has been essentially guided by three considerations : the accelerating pace of technological progress in the current phase of stable and sustained economic growth in the industrialised countries; the necessity for strengthening competitiveness of the European industrial system at the worldwide level in a climate of increased international competition; the need to respond in a more effective way to the directions fixed by the Single Act (the new Title VI of the EEC Treaty) for research and technological development.
  
5. The 1990-1994 framework programme proposal is characterised by the regrouping of activities around a limited number of strategic axes, thus guaranteeing pertinence, concentration and flexibility of management for Community activity.

Regrouped under three main headings (enabling technologies; management of natural resources; management of intellectual resources), six activities have been covered : information and communications technologies; industrial and materials technologies; environment; life sciences and technologies; energy; human capital and mobility.

The Commission declares its intention to propose, after approval of the framework programme, six specific programmes corresponding to the six activities foreseen.

6. The existence of a limited number of activities eventually corresponding to specific programmes will increase the necessary interdisciplinary nature of each area. It will also reinforce internal synergy between approaches and connected technologies.

However, this regrouping into large strategic areas does not necessarily imply any change in the size of individual projects, which should remain pertinent to

the objectives pursued and the need to assure appropriate participation of SMEs and universities.

Taking account of the greater coverage of the new specific programmes compared with that of current programmes, it will be useful to strengthen the consultation process with the scientific community and, in appropriate forms, inter-institutional co-operation.

7. As regards financial matters, a realistic but not unambitious approach has been adopted. This takes account at one and the same time of the needs of Community research over a period of five years and the perspective opened up by the inter-institutional agreement. This perspective constitutes in every case a ceiling, and not an expenditure target, the actual expenditure depending upon the importance and the quality of the activities which will be finally decided at the level of the specific programmes.

The overall budget allocation provided for allows for securing the continuity of commitments arising from the current 1987-1991 framework programme (3 125 MECUs) and for the launching, from 1990, of new or renewed activities by virtue of taking decisions on specific programmes (7 700 MECUs).

The actual release of the amounts deemed necessary beyond 1992 will require a second decision for each of the specific programmes to cover new commitments after 1992 in accordance with the budgetary discipline then in force.

8. The allocation of the amount deemed necessary between the six activities, like the choice of activities itself, responds to the need to avoid an automatic continuation of the existing situation. Research needs evolve. The pace of that evolution has become more rapid in the present phase of the world economy. The changes that result require a careful evaluation of the relative weights to

be given to the different activities, avoiding overlaps and duplication. The proposed scheme for the distribution of financial resources tries to meet this need.

9. In this scheme, the first activity, centered on information and communications technologies, suffers a small reduction in its allocation as a percentage of the total. However, this reduction is not constant within the activity itself. On the contrary, it arises from a more marked reduction in the more traditional areas and an appreciable increase for some new lines of research, such as those related to microelectronics and advanced networks for interconnections between information systems. In effect, the last two areas have acquired a growing importance : one is a critical factor for the international competitiveness of European industry, the other is an indispensable instrument for a true single market.
10. The relative weighting of funds assigned to activities in the sector of industrial and materials technologies remains constant. On the other hand, within the main topic concerning the management of natural resources, there is a redeployment of funds towards research on direct means of environmental protection and rehabilitation and towards research in the area of life sciences and technologies.

Against this, the funds allocated to research in the area of energy represent a net percentage reduction. This is due to the fact that, in the energy sector, one sees, on the one hand, the development of important projects arising from the current framework programme which, in many cases, will take several more years; and on the other hand, the adjustment of energy policies at the heart of the Community according to different priorities to those which have prevailed in the past.



11. Finally, the importance given to the activity related to a major project of mobility and training through research of young researchers at post-doctoral level should be underlined. Its importance is marked by the strong increase, in absolute and relative terms, in the funds which have been allocated to it.

In effect, it is to put into practice, at the Community level, a genuine, concerted management of intellectual resources, to contribute towards meeting the shortage of young researchers which is due to manifest itself in the 1990s and to increase the effectiveness of the machinery of Community research.

12. The structure of the framework programme described above allows those elements which differ from the current framework programme to stand out.

There are elements of necessary continuity. Work undertaken in the 1987-1991 framework programme is continued when the efficiency and pertinence of the work carried out at Community level and the continuing validity of the objectives can be confirmed.

However, there are elements of discontinuity and novelty. In certain cases, it is a question of introducing new dimensions, horizontal in nature, having a bearing on several areas independently of the nature of those areas. This is the case for the "environment" dimension; but, in a more general way, this is also the case for the "prenormative research" dimension. In other cases, it is a question of taking into account activities which respond to new strategic needs. Annex II of the current proposal indicates activities which are limited to emerging objectives. It also indicates activities which, on the other hand, will be reduced or abandoned.

Finally, mention must be made, amongst the characteristic elements of the new framework programme, of the Commission's intention to define a global initiative, applicable to all the research and development activities, for improving in a significant way the dissemination and enhancement of research results.

13. Putting into practice the activities foreseen and carrying out the resulting research projects requires an important effort from the Commission's services. It will not be enough to reaffirm the importance of proper administration for a framework programme that introduces numerous novel elements, some of which also affect procedural and management aspects.

The Commission undertakes forthwith to take the necessary measures, within its areas of responsibility, for improving the efficiency of its management and increasing in general the productivity of its administrative machinery. Control and evaluation methodologies, accompanied by new forms of decentralised management, will be introduced.

14. The Commission is fully aware that the current proposal involves a sizeable commitment, which implies at the same time, imagination and ingenuity in application, determination and flexibility. The Commission intends to meet this commitment, in each phase of the process that is begun by this proposal, starting from the interinstitutional discussions and leading to the approval of the new framework programme by the end of this year.

The Commission stresses the fact that this objective, as well as the work already undertaken, has been set out in the conclusions of the European Council in Madrid.

## II

*(Preparatory Acts)*

## COMMISSION

**Proposal for a Council Decision concerning the framework programme of Community activities in the field of research and technological development (1990 to 1994)**

*COM(89) 397 final*

*(Submitted by the Commission on 4 August 1989)*

*(89/C 243/06)*

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

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

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,

Having regard to the opinion of the European Parliament,

Having regard to the opinion of the Economic and Social Committee,

Whereas the Single European Act incorporated a Title VI (Articles 130f to 130q) into the EEC Treaty; whereas that Title constitutes the new legal basis for Community activities in the field of research and technological development; whereas, in particular, Article 130f lays down that the Community's aim is to strengthen the scientific and technological basis of European industry and to encourage it to become more competitive at international level; whereas, in order to achieve this, the Community is encouraging companies, including small and medium-sized undertakings, research centres and universities in their research and technological development activities and is supporting them through appropriate actions;

Whereas, on the basis of Article 130i, all Community activities in this field are set out in a multiannual framework programme;

Whereas, following an initial framework programme for the period 1984 to 1987, a second framework programme for the period 1987 to 1991 was adopted by the Council Decision 87/516/Euratom, EEC (1) and is in the process of being implemented;

Whereas, pursuant to Article 4 of the abovementioned Decision, the Commission examined the state of implementation of the second framework programme, in particular through an evaluation report prepared by a group of independent experts;

Whereas, in view of the rapid pace of technological development, new economic challenges which the Community must meet, the increased level of global competition and the need to keep in view the horizon beyond 1992, Community activities in the field of research and technological development must be intensified and made more complete; whereas, in the light of these factors, a new framework programme should be adopted for the period 1990 to 1994 in association with the current framework programme 1987 to 1991;

Whereas the Community's activities must be based on the principle of subsidiarity, and whereas the Community's activities in the field of research and technological development must thus provide added value in relation to activities carried out at national level;

Whereas the strengthening of research and technological development policy must constitute an element of the harmonious development and cohesion of the Community;

Whereas it is necessary to retain the pre-competitive nature of Community research and technological development and at the same time the process of technological progress requires a continuum of inter-linked activities, ranging from basic research to the demonstration of the applications of new technologies;

Whereas Community research and technological development activities should incorporate a prenormative dimension in order to guarantee the scientific and technical basis necessary to establish adequate norms and standards; and whereas such an approach is likely to facilitate the completion of the single market and to provide a response to the Community's increased

(1) OJ No L 302, 24. 10. 1987, p. 1.

responsibilities in the fields of environment, health and safety;

Whereas the Joint Research Centre is called on to contribute to the implementation of the framework programme in those fields in which an impartial and independent expert opinion is required for the benefit of all Community policies;

Whereas the dissemination and exploitation of the results of research and technological development activities are essential elements in the process of innovation, in particular for small and medium-sized undertakings, and whereas, for this reason, a global initiative should be undertaken which will apply to all activities in the field of research and technological development;

Whereas a new initiative should be launched to improve the mobility of young researchers at post-graduate level, relying on networks of centres of excellence throughout the Community;

Whereas efforts should be focused on a limited number of activities and specific programmes corresponding to the strategic priorities laid down in the framework programme;

Whereas the framework programme is implemented through specific programmes and whereas, furthermore, decisions may be taken on supplementary programmes within the meaning of Article 130l, participation within the meaning of Article 130m and cooperation with third countries or international organizations within the meaning of Article 130n;

Whereas the Community's involvement in Eureka projects which fit in with activities downstream of the Community's research and technological development strategy should be increased by means of appropriate instruments and the interface between the framework programme and European cooperation activities in the field of scientific and technical research (COST) should be improved, in accordance with Articles 130m and 130n;

Whereas it is necessary to make an estimate of the Community financial means necessary for the realization of the research and development activities envisaged, in accordance with Article 130i (1) of the EEC Treaty; whereas this amount is entered in the financial perspective included in the Inter-institutional Agreement of 29 June 1988 (\*) for the years 1990 to 1992; whereas the item 'IMPs and research' of the abovementioned perspective allows the retention of a sum of about ECU 2 400 million; whereas as a consequence of the annual technical adjustments provided for in the Agreement, the working assumption has been made that this amount will be about ECU 2 700 million;

Whereas it is appropriate to estimate the amount required for the implementation of the framework programme in 1993 and 1994, which, with regard to its realization in financial terms, shall comply with the budgetary discipline agreed upon for these years in a future agreement, taking as its basis the amount provided for the final year of application of the current Agreement;

Whereas the funds effectively available for the execution of the framework programme shall be determined according to the budgetary procedure in line with the abovementioned agreements;

Whereas it will be possible for new financial instruments drawing on market resources to be developed outside the framework programme but related to it, in order to facilitate exploitation of the results of research and technological development programmes;

Whereas the Commission, in discharging its responsibilities, undertakes to improve the efficiency of programme management, in particular by implementing an advanced monitoring system and decentralized procedures at the project level;

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

HAS DECIDED AS FOLLOWS:

#### *Article 1*

1. This framework programme for Community activities in the field of research and technological development, hereinafter referred to as the 'third framework programme', shall cover the period 1990 to 1994. The provisions laid down for specific programmes adopted in the context of Decision 87/516/Euratom, EEC concerning the framework programme for 1987 to 1991 shall remain in force.

2. The third framework programme shall provide for six activities grouped as follows:

#### *Diffusion technologies*

1. Information and communications technologies;
2. Industrial and materials technologies.

#### *Management of natural resources*

3. Environment;
4. Life sciences and technologies;
5. Energy.

#### *Management of intellectual resources*

6. Human capital and mobility.

3. Without prejudice to the amount of ECU 3 125 million deemed necessary in respect of the framework

(\*) OJ No L 185, 15. 7. 1988, p. 33.

programme for 1987 to 1991 which it will be possible to enter in the budget from 1990 onwards, the amount of Community expenditure deemed necessary for the execution of the activities envisaged by the present Decision shall be ECU 7 700 million. Of this amount, ECU 2 700 million are estimated to be necessary for the execution of the activities envisaged during 1990, 1991 and 1992 and ECU 5 000 million for the implementation of the activities envisaged during the years 1993 and 1994. The budgetary authority shall determine the available funds for each year.

4. The breakdown of the amount deemed necessary for the period 1990 to 1994 between the six activities referred to in paragraph 2 is set out in Annex I.

5. The activities referred to in paragraph 2 and their scientific and technical objectives are described in Annex II.

#### Article 2

1. The third framework programme shall be implemented through specific programmes in accordance with Articles 130k and 130p of the Treaty, covering each of the areas referred to in Article 1 (2).

2. For the implementation of the specific programmes, decisions may be taken on supplementary programmes within the meaning of Article 130l of the Treaty, on participation within the meaning of Article 130m, and on cooperation within the meaning of Article 130n.

3. The amounts deemed necessary for the implementation of each specific programme shall be the subject of

two Council decisions, covering the periods 1990 to 1992 and 1993 to 1994 respectively.

#### Article 3

The detailed rules for financial participation by the Communities in the third framework programme as a whole shall be those provided for in Title VII of the Financial Regulation of 21 December 1977 applicable to the general budget of the European Communities, without prejudice to the charging to the budget of any contributions from the Communities to supplementary programmes or to national or multinational activities or projects.

#### Article 4

The financing of activities related to the dissemination and exploitation of the results of the specific programmes shall be brought about, in the context of coherent management, by bringing together sums allocated to these activities according to a percentage to be determined for each specific programme.

#### Article 5

During the third year of execution of the third framework programme the Commission shall assess its progress. It shall examine, in particular, whether the objectives, priorities, activities envisaged, and financial resources are still appropriate to the changing situation. In the light of this review, as far as is necessary, it shall make proposals for the revision of the framework programme.

### ANNEX I

Framework programme of Community activities in the field of research and technological development (1990 to 1994)

Breakdown of the amount deemed necessary:

|  | <i>(in millions of ecus)</i> |
|--|------------------------------|
| <i>I. Enabling technologies</i>                  |                              |
| 1. Information and communications technologies   | 3 000                        |
| 2. Industrial and materials technologies         | 1 200                        |
| <i>II. Management of natural resources</i>       |                              |
| 3. Environment                                   | 700                          |
| 4. Life sciences and technologies                | 1 000                        |
| 5. Energy  | 1 100                        |
| <i>III. Management of intellectual resources</i> |                              |
| 6. Human capital and mobility                    | <u>700</u>                   |
| Total  | 7 700                        |

*ANNEX II***Activities**

The third framework programme (1990 to 1994) defines new objectives for giving an innovatory push to Community action. The orientations defined in the 1987 to 1991 framework programme remain in force in the implementation of the specific programmes, where an element of continuity is required.

The choice of scientific and technical objectives rests on the principle of Community added value. This principle, and the exercise of selectivity which results, are of vital importance for the efficient use of the limited funds at the Community's disposal. The modification of industrial attitudes towards further trans-national initiatives; replying to the essential challenges of industrial competitiveness; implanting European attitudes in the training of young researchers — these are the criteria that have guided the selection of objectives listed in the current Annex.

As concerns the preferred means of action, the shared-cost action remains the principal instrument. In those cases where coordination of existing research at the national level is the predominant aspect, concerted action will be used.

The Joint Research Centre participates in the implementation of the framework programme. A new emphasis will be given to this participation by reinforcing research with a prenormative character in the area of industrial and materials technologies; by a reorientation of research on nuclear safety; by the reinforcement of activities linked to the environment and industrial risks; and by a new emphasis on technological forecasting. The financing of JRC research activities relevant to the framework programme will be brought about by bringing together funds available from the sums allocated to the specific programmes.

The Council shall define the detailed arrangements for the dissemination of knowledge resulting from the specific programmes. This requires general action and a unified management within the Commission services to achieve coherence. In particular, this management has to provide for diffusion of results through publications as well as by computerized means according to common standards and protocols, the adaptation of industrial and intellectual property rules, innovation transfer and the exploitation of results within the Community. The financing of these activities is achieved by grouping funds deducted from the sums allocated to the specific programmes.

In strict accordance with the guiding character given to the framework programme by the Treaty, the following paragraphs make reference to the strategic elements of the 1990 to 1994 framework programme.

**I. ENABLING TECHNOLOGIES****1. Information and communications technologies**

The interaction between information and communications technologies, the increased requirements of users and the necessity to constitute a real nerve system for the single European area lead to a re-orientation of efforts along three main lines, while preserving the synergies required for subjects of great Community interest such as high-definition television.

**A. Information technologies**

Apart from the research produced within the Esprit Programme, re-oriented towards the new generation of technologies, laying more stress on prototypes and multi-supplier and distributed systems, new activities will receive priority in the following areas.

**— Microelectronics**

The objective is to contribute to the creation of a European manufacturing capability for advanced products, in particular integrated circuits in conjunction with the JESSI project. It is crucial to maintain the skills necessary to ensure the survival of the European electronics industry, associating the efforts of suppliers and users, and to enable potential new applications in the most advanced areas.

— Peripherals

The objective is to produce new generations which are reliable, low-cost and mass produced, taking into consideration for complex systems the most up-to-date technologies and for developing new manufacturing methods. The action should favour the appearance of new in-out and storage arrangements.

— Software

Systems and tools need to be developed enabling productivity in software production to be increased.

— IT applied to industrial engineering

The action will contribute to optimizing the use of advanced CAD/CAM systems in strategic industrial sectors.

*B. Communications technologies*

In parallel to the continued development of an integrated broadband network, the objective consists of developing intelligent, reliable and secure networks as well as new value-added and profitable services adapted to developing user needs.

Priority has also to be given to the growing demand for mobile telephony services and the integration of these services into networks. The requirements to be taken into account concern those of private life and leisure as well as professional life. To meet these needs and ensure a flexible transition between successive generations of networks, the following actions are foreseen:

- development of intelligent networks, using new techniques of information transfer, optical communications and artificial intelligence;
- mobile communications: specific issues need to be resolved, such as communication security, saturation of available frequencies, the efficient use of airborne methods of transmission, equipment miniaturization and the integration of mobile telephony into universal networks;
- image communication: building on numerical image transfer (including HDTV), research efforts are needed to integrate image into multimedia communications and to ensure the development of allied protocols and coders-decoders;
- service engineering: work on architectures and software, realized on basic teleservices and on improved value-added services.

These actions will be accompanied by others, aimed at ensuring the reliability and the security of communications by means of developing verification and testing technologies. Finally, it will be necessary to identify the characteristics and common function of certain model services by realizing real scale experiments in advanced communications.

*C. Development of telematic systems in areas of general interest*

The realization of the large internal market is setting new requirements in the field of information exchange. At the level of public administration, faced with problems determined by the abolition of barriers and the realization of the single market, these requirements comprise topics such as the interior, justice, customs, and social security. At the level of the individual user, questions of transport, health, distance learning, environmental protection and access to rural areas predominate.

To meet these requirements, beyond the efforts being undertaken within regional or national contexts, additional Community effort is needed. This comprises the development of telematics systems combining information technologies, communications and audio-visual techniques. Industrialists, network users and suppliers throughout the Community will be encouraged to regroup around projects which meet both the requirements of economic development and social demand, thereby cementing a community of interest and spirit.

These projects, the full development of which will take place outside the framework programme, require preparatory R & D work, including language research and engineering, of a collaborative nature and including pilot experiments which will act as a catalyst and form the building blocks for future action.

**2. Industrial and materials technologies**

The objective is to contribute to the necessary rejuvenation of European manufacturing industry by developing its science base and the advanced technologies required. Technological developments will be integrated with considerations of emerging market requirements and of more severe environmental constraints. Priority will be given to major integrated projects; among these, the development of the 'clean car'.

This strategic step leads to a shift in priorities in the areas described below accompanied by the phasing out of areas such as membranes and catalysis.

— **Materials**

Emphasis will be placed on materials with specific properties, exploiting recent breakthroughs in the understanding of microscopic structure;

- on materials for use in extreme or unusual conditions, as well as on environmental and whole life cycle aspects of materials, including recovery and recycling.

— **Design**

Reducing 'design to product' lead time requires advances in the scientific and technical basis of design, including materials selection, systems analysis, design rules for manufacture, assembly, reliability and maintenance. Emphasis is placed on design-relevant enabling technologies, such as fluid dynamics, power systems and acoustics; process control, particularly aimed at 'zero-defects' products.

— **Manufacturing**

Improvement of the management of manufacturing operations: manufacturing practices must aim at greater efficiency, shorter implementation times, reduced 'work in progress' and unit costs, higher quality levels. Research includes mathematical modelling, adaptation of computer-aided design and manufacturing techniques, especially for small and medium-sized enterprises.

— **Measurement and testing**

A new emphasis on the formulation and implementation of common norms, standards and codes of practice is stimulated by the completion of the internal market. This leads to new requirements for scientific and technological know-how to provide an objective base for normative work.

## II. MANAGEMENT OF NATURAL RESOURCES

### 3. Environment

The purpose is to provide the scientific knowledge and technical know-how needed by the Community to carry out its new role relating to the environment, according to Title VII of the EEC Treaty. In this sector, the research activities have a common horizontal dimension of prenormative research, aimed at the preparation of environmental quality norms, safety and technical norms, methodologies for environmental impact assessment. The new actions are concerned with the following four areas.

— **Participation in the Global Change Programme**

The objective of the programme is to understand the processes governing environmental change and to assess the impact of human activities. European participation will contribute to the development of research on the interaction between biogeochemical cycles, atmospheric chemistry, physical and chemical oceanography, climatic processes.

— **Technologies and engineering for the environment**

In addition to research on environmental monitoring, including remote sensing, a specific action will be directed at introducing techniques and engineering systems to protect and rehabilitate the environment.

— **Large integrated research projects**

These projects address the whole range of problems arising from major environmental issues. They may concern large coordinated campaigns, from observation and experimentation focusing on the continental or marine environment to integrated operations attacking all aspects of a regional issue.

— **Research on economic and social aspects**

This includes the scientific research to support the study of the legal and ethical aspects of environmental policy and management. This deals with risk assessment, perception and management; the economic evaluation of environmental impacts; the socio-economic impact of the implementation of environmental policies; and the effectiveness and consistency of laws and regulations related to environmental matters.



#### 4. Life Sciences and technologies

The long-term strategic objective is to contribute, in a selective and integrated way, to the development of Europe's potential for understanding and using the properties and structures of living matter.

— Basis biotechnology

Emphasis is shifted towards strengthening the science base, through research centred on understanding biological information, transformation and control systems, whilst keeping in mind the ethical implications of such work. In particular, the research actions will include genome analysis, related to genomes of representative species; neurobiology and immunology; macromolecular modelling; nutrition; testing, also in order to provide the scientific prenormative basis for Community regulations.

— Agricultural and agro-industrial research

Research in the agricultural and forestry sectors will include projects on crop and animal production, taking into account the present objectives of the common agricultural policy and of rural development; it will contribute to major interdisciplinary programmes, such as a programme aimed at finding effective remedies for desertification. Research will be developed in the field of aquaculture and fisheries. Research, development and demonstration actions will be taken beyond current activities, exploiting results from plant molecular biology and physiology research, through soil-plant interaction, to harvesting and processing. Emphasis is placed on increasing resistance of plants to adverse agents by genetic means. In the field of industrial utilization of agricultural raw materials, the strategic priority is to obtain, through chemical and biological processing, new biodegradable products and to provide clean energy sources by exploiting biomass.

— Biomedical and health research

The main focus is on new ways of tackling socially and economically relevant diseases, through concerted methodological and protocol studies in epidemiological, experimental and clinical research. For cancer, attention is shifted towards early tracing of carcinogenic factors and the development of new tests for anti-carcinogenic drugs. For AIDS, a new activity aimed at the development of control systems, including chemotherapy and vaccines will be developed.

— Life sciences and technologies for developing countries

Emphasis is placed on tropical agriculture (integrated management of agricultural resources for reducing food shortages in regions at risk whilst protecting the environment) and on tropical health research (efforts are concentrated on new steps to combat some major tropical diseases).

#### 5. Energy

Environmental compatibility has become a key element for energy systems. Therefore the central issue of Community action in this field is shifted towards the development of clean and safe energy technologies. This is pursued in the following three areas:

— Fossil, renewable energy sources, energy utilization

A diversity of technological options is required, taking into account energy-related environmental problems such as the greenhouse effect and acid rain. The research includes the use of hydrogen and other suitable substitutes for liquid fuels in the transport sector. In-depth analysis is carried out on the concept of 'zero emission power', which is focused on electricity generation having a minimal environmental impact. Certain lines of research inconsistent with this approach are discontinued, such as research on coal liquefaction. Following recent breakthroughs in the understanding of combustion processes, and of new electrolytes and catalysts, new energy production and saving technologies will be developed.

— Nuclear fission safety

Community action will put further emphasis on the harmonization of safety approaches and thus reinforce the prenormative dimension of its research. A new impulse will be given to research on reactor safety, radioactive waste management, fuel elements, actinides and control of fissile materials. Radiation protection research will include radiation from natural and medical sources, a better definition of the risks of low radiation doses, new technologies to assess quickly the radiological consequences of nuclear accidents.

— Controlled nuclear fusion

The Jet Joint Undertaking is prolonged up to 1996, in order to achieve control of plasma in conditions close to those of the Next Step (Engineering fusion test reactor). Work for the detailed design of the Next Step as well as for new systems will be pursued. Some existing fusion devices will be phased out having completed their experimental programmes. The present keep in touch activity in inertial confinement is developed, through fundamental research on the interaction of plasma with laser light and possibly with accelerated heavy particles. Muonic and other cold fusions will be explored.

### III. MANAGEMENT OF INTELLECTUAL RESOURCES

#### 6. Human capital and mobility

The purpose is to provide the European research system with the trained human resources on which it is critically dependent and which are likely to become increasingly scarce in the years to come.

A new initiative characterized by the highest efficiency and Community added value is required. These two requisites are inherent in a major project of mobility of young researchers, at post-graduate level, in the area of the exact and natural sciences, technologies and economic science. Training at the interface between basic sciences and technological applications will be pursued.

The Community will finance the cost of training, generally for a period of two years, in centres of excellence of a country different from the country of origin. This is a Community investment in human capital, which will have pervasive effects over the whole research and technological development system and on cohesion and the redressing of intracommunity imbalances. This investment can, where necessary, be complemented by support measures in favour of networks of research training centres.

An important role in the implementation of the programme will be played by the scientific community itself, through its own institutions, particularly for the identification of networks of centres of excellence and the selection of candidates.

---

COMMISSION OF THE EUROPEAN COMMUNITIES

EUROPEAN CUSTOMS INVENTORY OF CHEMICALS

A guide to the tariff classification of chemicals in the combined nomenclature  
(English version)

This work includes:

- 32 000 chemical names (internationally accepted common names, systematic names and synonyms).
- Nine languages: Danish, German, English, Greek, Spanish, French, Italian, Dutch and Portuguese.

Features of this publication are:

- The classification (heading and subheading) of a chemical in the new customs tariff of the European Communities can be ascertained immediately from its name in any one of the nine languages.
- The nomenclature in this new tariff (combined nomenclature) is based on the nomenclature of the 'harmonized commodity description and coding system' which entered into force on 1 January 1988.
- The equivalent names in all nine languages (multilingual glossary) obtainable by means of a common key-number (CUS No).
- A means of finding the CAS number (chemical abstracts registry number).

640 pp.

Published in: ES, DA, DE, GR, EN, FR, IT, NL, PT.

Catalogue number: CB-52-88-348-EN-C      ISBN: 92-825-7919-0

Price (excluding VAT) in Luxembourg:

per single-language volume:

|           |           |          |           |           |        |
|-----------|-----------|----------|-----------|-----------|--------|
| ECU 33,75 | BFR 1 450 | DR 5 600 | IRL 26,50 | UKL 23,50 | USD 42 |
|-----------|-----------|----------|-----------|-----------|--------|

per nine-volume set (nine languages):

|         |            |           |         |         |         |
|---------|------------|-----------|---------|---------|---------|
| ECU 232 | BFR 10 000 | DR 38 300 | IRL 180 | UKL 160 | USD 285 |
|---------|------------|-----------|---------|---------|---------|



OFFICE FOR OFFICIAL PUBLICATIONS OF THE EUROPEAN COMMUNITIES  
L-2985 Luxembourg

FINANCIAL STATEMENT

1. Pursuant to article 130i (1) of the Treaty, the proposal for a framework programme 1990-94 fixes the amount deemed necessary as well as the breakdown of this amount between the various activities envisaged. The breakdown, which is to be found at Annex I of the proposal, is as follows (amounts expressed in millions of ECUs ).

I. Enabling technologies

|    |   |       |
|----|---|-------|
| 1. | Information and communications technologies | 3 000 |
| 2. | Industrial and materials technologies       | 1 200 |

II. Management of natural resources

|    |                                |       |
|----|--------------------------------|-------|
| 3. | Environment                    | 700   |
| 4. | Life sciences and technologies | 1 000 |
| 5. | Energy                         | 1 100 |

III. Management of intellectual resources

|    |                            |     |
|----|----------------------------|-----|
| 6. | Human capital and mobility | 700 |
|----|----------------------------|-----|

-----  
TOTAL 7 700

Appropriations for the JRC and for the dissemination of results will be entered under separate headings drawn from the above amounts.

This amount deemed necessary equals the sum of the amounts allocated for the execution of programmes decided upon for the implementation of the framework programme.

- 2. The amounts which are to be set out on a yearly basis in the budget will be determined by the budgetary authority through the annual budgetary procedures on the basis of the allocations for the programmes and the expenditure foreseen as well as in compliance with the budgetary discipline then in force.

An indicative schedule for commitments to be set out in successive budgets under the heading of the framework programme 1990-1994 is given in the following table.

Indicative schedule for item 3 of the financial perspective  
(amounts in millions of ECUs)

|                           | 1990    | 1991    | 1992     | 1993    | 1994    | Total   |
|---------------------------|---------|---------|----------|---------|---------|---------|
| Financial perspective (a) | 2 071   | 2 422   | 2 796    |         |         |         |
| I.M.P.                    | 344.0   | 355.0   | 196.1    |         |         |         |
| F.P. 84-87                | 4.2     |         |          |         |         |         |
| F.P. 87-91                | 1 552.3 | 709.7   | 831.7(b) |         |         |         |
| F.P. 90-94                | 29.5    | 1 200.5 | 1 470.0  | 2 400.0 | 2 600.0 | 7 700.0 |
| Outside F.P.              | 137.0   | 150.0   | 165.0    |         |         |         |
| Total                     | 2 067.0 | 2 415.2 | 2 662.8  |         |         |         |

- (a) The amounts for the financial perspective for the years 1991 and 1992 are calculated on the basis of an annual inflation rate of 3.5 %
- (b) 31.3 million will be committed in the 1993 and 1994 exercises.

3. The annual amounts shall cover scientific, technical and demonstration activities as well as personnel costs and administrative, scientific and technical expenses directly linked to the execution of the programmes. As far as activities carried out by the JRC are concerned, these amounts shall also cover the infrastructure for the institutes.
4. The financial and budgetary execution of the programmes will take place in accordance with the provisions of the Financial Regulation, in particular the Title dealing with research and investment appropriations.

ISSN 0254-1475

COM(89) 397 final

# DOCUMENTS

EN

16 19

---

Catalogue number : CB-CO-89-375-EN-C

ISBN 92-77-52630-0

---