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II

(Acts whose publication is not obligatory)

COUNCIL

COUNCIL DECISION

of 7 June 1991

adopting a specific research and technological development programme in the field of marine science and technology (1990 to 1994)

(91/351/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 130q (2) thereof,

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

In cooperation with the European Parliament ⁽²⁾,

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

Whereas, by Decision 90/221/Euratom, EEC ⁽⁴⁾, the Council adopted a third framework programme for Community activities in the field of research and technological development (1990 to 1994), specifying *inter alia* the activities to be pursued for developing the scientific knowledge and technical know-how needed by the Community, in particular to carry out its role in the field of marine science and technology; whereas this Decision should be taken in the light of the grounds set out in the preamble to that Decision;

Whereas Article 130k of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity;

Whereas basic research in the field of marine science and technology must be encouraged throughout the Community;

Whereas in addition to the specific programme concerning human resources and mobility, it might be necessary to encourage the training of research workers in the context of this programme;

Whereas, in the context of this programme, an assessment should be made of economic and social impact as well as of any technological risks;

Whereas, pursuant to Article 4 of and Annex I to Decision 90/221/Euratom, EEC, the amount deemed necessary for the whole framework programme includes an amount of ECU 57 million for the centralized dissemination and exploitation of results, to be divided up in proportion to the amount envisaged for each specific programme;

Whereas Decision 90/221/Euratom, EEC, provides that a particular aim of Community research must be to strengthen the scientific and technological basis of European industry and to encourage it to become more competitive at the international level; whereas it also provides that Community action is justified where research contributes, *inter alia*, to the strengthening of the economic and social cohesion of the Community and to the promotion of its overall harmonious development, while being consistent with the pursuit of scientific and technical excellence; whereas the programme in the field of marine science and technology should contribute to the achievement of these objectives;

Whereas small and medium-sized enterprises should be involved to the maximum extent possible in this programme; whereas account should be taken of their special requirements without prejudice to the scientific and technical quality of the programme;

⁽¹⁾ OJ No C 174, 16. 7. 1990, p. 48.

⁽²⁾ OJ No C 324, 24. 12. 1990, p. 298; and OJ No C 158, 17. 6. 1991.

⁽³⁾ OJ No C 332, 31. 12. 1990, p. 38.

⁽⁴⁾ OJ No L 117, 8. 5. 1990, p. 28.

Whereas it is necessary, as Annex II to Decision 90/221/Euratom, EEC provides, to acquire a sound basis of knowledge and of reliable forecasting techniques in order to work out long-term strategies for protecting and managing the marine environment, directing research towards the understanding of the fundamental processes which govern both oceans and coastal waters;

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

HAS ADOPTED THIS DECISION:

Article 1

A specific research and technological development programme for the European Economic Community in the field of marine science and technology, as defined in Annex I, is hereby adopted for a period beginning on 7 June 1991 and ending on 31 December 1994.

Article 2

1. The funds estimated as necessary for the execution of the programme shall amount to ECU 102,96 million, including expenditure on staff and administration amounting to ECU 10 million.
2. An indicative allocation of funds is set out in Annex III.
3. Should the Council take a decision in implementation of Article 1 (4) of Decision 90/221/Euratom, EEC, this Decision shall be adapted accordingly.

Article 3

Detailed rules for the implementation of the programme and the amount of the Community's financial contribution are set out in Annex III.

Article 4

1. In the second year of implementation of the programme, the Commission shall review it and send a report on the results of its review to the European Parliament and the Council; the report shall be accompanied, where necessary, by proposals for amendment of the programme.
2. At the end of the programme, an evaluation of the results achieved shall be conducted for the Commission by a group of independent experts. This group's report, together with any comments by the Commission, shall be submitted to the European Parliament and the Council.
3. The reports referred to in paragraphs 1 and 2 shall be established having regard to the objectives set out in Annex I to this Decision and in accordance with Article 2 (4) of Decision 90/221/Euratom, EEC.

Article 5

1. The Commission shall be responsible for the implementation of the programme.
2. Contracts concluded by the Commission shall govern the rights and obligations of each party, in particular the arrangements for the dissemination, protection and exploitation of research results, in accordance with the provisions adopted pursuant to the second subparagraph of Article 130k of the Treaty.
3. A work programme shall be drawn up in accordance with the aims set out in Annex I and updated where necessary. It shall set out the detailed objectives and types of projects to be undertaken, and the financial arrangements to be made for them. The Commission shall make calls for proposals for projects on the basis of the work programme.

Article 6

1. The Commission shall be assisted by a committee composed of the representatives of the Member States and chaired by the representative of the Commission.
2. The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft, within a time limit which the chairman may lay down according to the urgency of the matter, if necessary by taking a vote.
3. The opinion shall be recorded in the minutes; in addition, each Member State shall have the right to request that its position be recorded in the minutes.
4. The Commission shall take the utmost account of the opinion delivered by the committee. It shall inform the committee of the manner in which its opinion has been taken into account.

Article 7

1. The procedure laid down in Article 6 shall apply in particular to:
 - the preparation and updating of the work programme referred to in Article 5 (3),
 - the contents of the calls for proposals,
 - the assessment of the projects provided for in Annex III and the estimated amount of the Community's contribution to them where this amount exceeds ECU 0,3 million,
 - departures from the general rules set out in Annex III,
 - the participation in any project by non-Community organizations and enterprises referred to in Article 8 (1) and (2),

- any adaptation of the indicative allocation of the amount set out in Annex II,
- the measures to be undertaken to evaluate the programme,
- arrangements for the dissemination, protection and exploitation of the results of research carried out under the programme.

2. Where, pursuant to the third indent of paragraph 1, the amount of the Community contribution is less than or equal to ECU 0,3 million, the Commission shall inform the Committee of the projects and of the outcome of their assessment.

The Commission shall also inform the Committee of the implementation of the accompanying measures and concerted action referred to in Annex III.

Article 8

1. The Commission is authorized to negotiate, in accordance with Article 130n of the Treaty, international agreements with third countries which are members of COST, particularly the member countries of EFTA and the countries of Central and Eastern Europe, with a view to associating them with the whole programme or a part of it.

2. Where framework agreements for scientific and technical cooperation have been concluded between the Community and European non-member States, bodies and enterprises established in those countries may, in accordance with the procedure laid down in Article 6 and on the basis of the criterion of mutual benefit, be allowed to become partners in a project undertaken within the programme.

No contracting body based outside the Community and participating as a partner in a project undertaken under the programme may benefit from Community financing for this programme. The body concerned shall contribute to the general administrative costs.

Article 9

This Decision is addressed to the Member States.

Done at Luxembourg, 7 June 1991.

For the Council

The President

R. STEICHEN

ANNEX I

SCIENTIFIC AND TECHNICAL OBJECTIVES AND CONTENT

This specific programme fully reflects the approach embodied in the third framework programme in terms of the scientific and technical goals and the underlying aims which it pursues.

Paragraph 3.C of Annex II to the framework programme forms an integral part of the present specific programme.

The new marine science and technology programme is presented as a direct development of MAST 1989 to 1992.

The general objectives of the new programme must, therefore, be similar to those of the pilot programme, namely to contribute to establishing a scientific and technological basis for the exploration, exploitation, management and protection of European coastal waters and the seas surrounding the Community Member States, and furthermore introduce the necessary Community dimension to various on-going research activities. This programme will also aim to achieve a balance in the marine scientific potential between the various areas of the European Communities. A special effort will be made to upgrade existing research.

The technical content of the proposed programme will be broadly the same as for MAST 1989 to 1992. Alterations are proposed as a result of the need for programmes of large-scale target research projects and the possible expansion of the geographical coverage.

The following presents an analytical description of the content of the programme, based on and taking account of the above elements.

AREA 1: MARINE SCIENCE

Community research in marine science has three main aims, which are as follows:

- to achieve a better understanding of marine processes,
- to improve our ability to predict change,
- to establish the scientific basis for management, protection and exploitation of the marine environment.

Multidisciplinary research will be carried out on processes and fluxes, using mathematical modelling where necessary. Where modelling is used in the study of marine processes, it will include validation calibration and assessment of boundary conditions at various time scales.

Detailed and expanded studies of ocean circulation systems and dynamics of water masses will be carried out in order to determine the water movement and physical processes in European seas and adjacent oceans. Special attention will be given to the shelf edge and the intertidal zone, deep water formation and studies on ocean circulation.

Research will be continued and further work will be carried out on biogeochemical processes, in particular to understand and quantify the fluxes of carbon and other elements in the sea. Hydrothermal activity is also included as well as the global carbon cycle in coastal, continental and deep seas.

Studies will be undertaken to evaluate rates of exchange of substances at interactive sites (e.g. various interfaces: air-sea, sea floor-water column, land-sea, etc.), particularly during extreme environmental conditions.

Research will be aimed at deriving mathematical expressions and reliable models for biological processes and ecosystems. Particular attention will be given to projects which examine the link between physico-chemical influences and the corresponding biological responses at all trophic levels.

Research in marine geosciences will be expanded to include stratigraphy and geophysics as well as addressing specific problems relating to the behaviour of sediments in various marine situations (e.g. shelf, slope and deep sea). Investigations of the geological record and geophysical properties of deep-sea sediments are required to contribute to global change research and to assess the appropriate use of the seabed.

Coordination with and concertation of participation in ongoing international programmes (e.g. World Ocean Circulation Experiment, Joint Global Ocean Flux Studies, International Geosphere-Biosphere programme, etc.) will be encouraged. Work in this area will be carried out in cooperation with Community programmes on the marine environment (e.g. STEP, Epoch and JRC actions) and, possibly, renewable energy sources (tides, waves, etc.), aquaculture and fishing (FAR). In marine geosciences, overlap with work in the ocean drilling programme will be avoided.

AREA 2: COASTAL ZONE SCIENCE AND ENGINEERING

The objectives, which build on projects in the MAST 1989 to 1992 pilot phase, are: to gain an increased level of understanding of marine processes affecting the coastal zone and the behaviour of coastal structures, and of their interactions; to develop numerical modelling of coastal processes and the integration of process models for purposes of coastal management in Europe; and to harmonize on a European scale design concepts of coastal engineering works.

Research will, therefore, concentrate on the study of currents, waves, the behaviour of sediments (mobilization, transport, deposition, geotechnical properties), as well as changes in seabed and coastline morphology. Coastal engineering research will further develop work on the impact of waves and other coastal processes on the stability of breakwaters and other structures.

A particular aim is to promote Europe's lead in these fields by helping to formulate European guidelines for coastal engineering. Research to improve beach nourishment schemes and protection 'against the sea' will also be undertaken. Coordination with the climatology part of the new environment programme will be assured.

AREA 3: MARINE TECHNOLOGY

The objective is to encourage the necessary enabling technologies for the advancement of the marine sciences and related industrial development and to promote the development of existing and new instruments, particularly with a view to speeding up the introduction of automated long-term measuring systems and contributing to the development of operational observation systems.

The research will concern the development of new sensors (quasi) real-time data transmission and two-way communication links. Further work will be aimed at instruments for measuring and sampling in the water column and on and below the sea floor. Research in underwater acoustics will be aimed at self-navigation of vehicles, determination of the properties of the ocean environment and its substratum, acoustic communication, sub-bottom profiling and innovative acoustic measurements in particular. Selective actions in the development of new or improved enabling technologies, e.g. acoustic imaging and optics, will be undertaken. *In situ* design and demonstration work will be done on a system for monitoring the principal environmental parameters relating to coastal waters.

Studies on the identification and exploitation of natural substances in the marine environment will be carried out. Impact studies on the exploitation of marine mineral resources (sand and gravel, nodules, algae, substances useable in pharmacy) will be implemented. These studies are also aimed at achieving greater knowledge of the effects of the waste caused by human activities in the pelagic environment. Additional efforts will be made to reinforce technologies for the study and monitoring of the deep sea environment.

Research will not qualify for Community support unless it is compatible with the Community's policy on protection of the environment.

This research will be coordinated with the Eureka initiatives in marine sciences and technology and will supplement work in Brite/Euram and Esprit in the materials testing, robotics and informatics aspects of instrument development.

AREA 4: SUPPORTING INITIATIVES

The supporting initiatives which commenced under the MAST pilot programme will be continued, and will thus include the following:

- the establishment of a European ocean data and information system, including a system on the management of data on remote sensing,
- the preparation of norms and standards for marine science and technology,

- a modelling coordination initiative which includes modelling for management purposes,
- development of a pilot communication system for exchange of information on research cruises and research facilities,
- studies on the scientific and design requirements for new large-scale facilities,
- advanced training,
- new approaches to mapping and bathymetric/hydrographic surveying.

New ideas for supporting initiatives may be added as the need arises.

AREA 5: LARGE-SCALE TARGET PROJECTS

Target projects will be developed to address particular problems which require large-scale multidisciplinary coordinated research effort. These problems could be defined on the basis of scientific and technological requirements or established on the basis of the scientific requirements of a particular geographical area. The need to balance the deficit of scientific capabilities in some countries will also be taken into account when defining the target projects.

ANNEX II

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

<i>(in million ecus)</i>	
Area	Breakdown
1. Marine science	37,06
2. Coastal zone science and engineering	15,40
3. Marine technology	29,80
4. Support initiatives	5,20
5. Large-scale targeted projects	15,50
	Total 102,96 ⁽¹⁾ ⁽²⁾

⁽¹⁾ Including expenditure on staff which comes to ECU 5,14 million and administrative expenditure totalling ECU 4,86 million. At least 2 % of the total will be allocated to training and 3 % risk evaluation.

⁽²⁾ A sum of ECU 1,04 million, not included in the ECU 102,96 million, will be earmarked as the contribution from the specific programme in the field of marine science and technology to the centralized scheme for the dissemination and exploitation of results.

The breakdown between different headings does not exclude the possibility that projects could come under several headings.

ANNEX III

RULES FOR IMPLEMENTING THE PROGRAMME

1. The Commission will implement the programme on the basis of the objectives and of the scientific and technical content described in Annex I.
2. The rules for implementing the programme, referred to in Article 3, comprise research and technological development projects, accompanying measures and concerted actions:

— *Research projects*

The projects will be the subject of shared-cost research and technological development contracts. Selection of projects must take account of the criteria listed in Annex III to Decision 90/221/Euratom, EEC and of the objectives set out in Annex I to this programme.

For shared-cost projects, Community financial participation will not normally be more than 50 %. Universities and other research centres participating in shared-cost projects will have the option of requesting, for each project, either 50 % funding of total expenditure or 100 % funding of the additional marginal costs.

Shared-cost research projects must, as a general rule, be carried out by participants established within the Community. Projects in which, for example, universities, research organizations and industrial firms, including small and medium-sized enterprises, may participate must, as a general rule, provide for the participation of at least two partners, the one being independent of the other and established in different Member States. Contracts relating to shared-cost research projects must, as a general rule, be concluded following a selection procedure based on calls for proposals published in the *Official Journal of the European Communities*.

The Commission will publish a vade-mecum setting out all the rules applying to the selection of projects, in order to guarantee full transparency.

— *Accompanying measures*

The accompanying measures referred to in Article 7 will consist of:

- the organization of seminars, workshops and scientific conferences,
- internal coordination through the creation of integrating groups,
- advanced technology training programmes, with emphasis being placed on multidisciplinary,
- promotion of the exploitation of results,
- independent scientific and strategic evaluation of the operation of the projects and the programme.

— *Concerted actions*

Concerted actions consist of action by the Community to coordinate the individual research activities carried out in the Member States. They may benefit from funding of up to 100 % of coordinating expenditure.

3. The knowledge acquired in the course of the projects will be disseminated both within the specific programme and by means of a centralized activity, pursuant to the Decision referred to in the third subparagraph of Article 4 of Decision 90/221/Euratom, EEC.

COUNCIL DECISION

of 7 June 1991

adopting a specific research and technological development programme in the field of communication technologies (1990 to 1994)

(91/352/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 130q (2) thereof,

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

In cooperation with the European Parliament ⁽²⁾,

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

Whereas, by Decision 90/221/Euratom, EEC ⁽⁴⁾, the Council adopted a third framework programme for Community activities in the field of research and technological development (1990 to 1994), specifying *inter alia* the activities to be pursued in the field of communication technologies; whereas this Decision should be taken in the light of the grounds set out in the preamble to that Decision;

Whereas Article 130k of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity;

Whereas in addition to the specific programme concerning human resources and mobility, it might be necessary to encourage the training of research workers in the context of this programme;

Whereas, pursuant to Article 4 of and Annex I to Decision 90/221/Euratom, EEC, the amount deemed necessary for the whole framework programme includes an amount of ECU 57 million for the centralized dissemination of knowledge and exploitation of results of the programmes, to be divided up in proportion to the amount envisaged for each specific programme;

Whereas, in the context of this programme, an assessment should be made of economic and social impact as well as of any technological risks;

Whereas Decision 90/221/Euratom, EEC provides that a particular aim of Community research must be to strengthen

the scientific and technological basis of European industry, particularly in strategic sectors of advanced technology, and to encourage it to become more competitive at the international level; whereas it also provides that Community action is justified where research contributes, *inter alia*, to the strengthening of the economic and social cohesion of the Community and to the promotion of its harmonious development, while being consistent with the pursuit of scientific and technical excellence; whereas this should contribute to the achievement of these objectives;

Whereas small and medium-sized enterprises should be involved to the maximum extent possible in this programme; whereas account should be taken of their special requirements without prejudice to the scientific and technical quality of this programme;

Whereas the constitution or consolidation of a specifically European industrial potential in the technologies concerned is an urgent necessity; whereas its beneficiaries must be network operators, research establishments, undertakings, including small and medium-sized undertakings and other bodies established in the Community which are best suited to attain these objectives;

Whereas priorities include integrated broadband communication system functions, intelligence in networks, mobile and personal communication, image and data communications, integrated services technologies, advanced communications experiments, information security technologies and test infrastructures; whereas the work includes R&D on systems engineering, advanced communications technology and validation of standards and common functional specifications;

Whereas basic research must be encouraged as far as is necessary throughout the Community;

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

HAS ADOPTED THIS DECISION:

Article 1

A specific research and technological development programme for the European Economic Community in the field of communication technologies, as defined in Annex I, is hereby adopted for a period beginning on 7 June 1991 and ending on 31 December 1994.

⁽¹⁾ OJ No C 174, 16. 7. 1990, p. 9.

⁽²⁾ OJ No C 19, 28. 1. 1991, p. 139; and OJ No C 158, 17. 6. 1991.

⁽³⁾ OJ No C 41, 18. 2. 1991, p. 12.

⁽⁴⁾ OJ No L 117, 8. 5. 1990, p. 28.

Article 2

1. The funds estimated as necessary for the execution of the programme amount to ECU 484,1 million, including expenditure on staff and administration amounting to ECU 41 million.
2. An indicative breakdown of funds is set out in Annex II.
3. Should the Council take a decision pursuant to Article 1 (4) of Decision 90/221/Euratom, EEC, this Decision shall be adapted accordingly.

Article 3

Detailed rules for the implementation of the programme and the amount of the Community's financial contribution are set out in Annex III.

Article 4

1. In the second year of implementation of the programme, the Commission shall review it and send a report on the results of its review to the European Parliament and the Council; the report shall be accompanied, where necessary, by proposals for amendment of the programme.
2. At the end of the programme, an evaluation of the results achieved shall be conducted for the Commission by a group of independent experts. This group's report, together with its comments, shall be submitted to the European Parliament and the Council.
3. The reports referred to in paragraphs 1 and 2 shall be established having regard to the objectives set out in Annex I to this Decision and in accordance with Article 2 (4) of Decision 90/221/Euratom, EEC.

Article 5

1. The Commission shall be responsible for the implementation of the programme.
2. Contracts concluded by the Commission shall govern the rights and obligations of each party, in particular the arrangements for the dissemination, protection and exploitation of research results, in accordance with the provisions adopted pursuant to the second paragraph of Article 130k of the Treaty.
3. A work programme shall be drawn up in accordance with the objectives defined in Annex I and updated where necessary. It shall set out the detailed objectives and types of projects to be undertaken, and the financial arrangements to be made for them. The Commission shall draw up calls for proposals for projects on the basis of the work programme.

Article 6

1. The Commission shall be assisted by a committee composed of representatives of the Member States and chaired by the representative of the Commission.

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

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

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

5. If, on the expiry of a period of three months from referral of the matter to the Council, the latter has not acted, the proposed measures shall be:

- adopted by the Commission, in the case of matters covered by the second, third, fourth, fifth, sixth, seventh and eighth indents of Article 7,
- adopted by the Commission, save where the Council has decided against the said measures by a simple majority, in the case of matters covered by the first indent of Article 7.

Article 7

1. The procedure laid down in Article 6 shall apply to:

- the preparation and updating of the work programme referred to in Article 5 (3),
- the assessment of the projects provided for in Annex III and the estimated amount of the Community's contribution to them where that amount exceeds ECU 2 million,
- the contents of the calls for proposals,
- any adaptation of the indicative breakdown of the amount set out in Annex II,
- the measures to be undertaken to evaluate the programme,
- arrangements for the dissemination, protection and exploitation of the results of research carried out under the programme,
- departures from the general rules set out in Annex III.
- the participation in any project by non-Community organizations and enterprises referred to in Article 8 (1) and (2).

2. Where, pursuant to the second indent of paragraph 1, the amount of the Community contribution is less than or equal to ECU 2 million, the Commission shall inform the Committee of the projects and of the outcome of their assessment.

The Commission shall also inform the Committee of the implementation of the accompanying measures and the concerted action projects referred to in Annex III.

Article 8

1. The Commission is authorized to negotiate, in accordance with Article 130n of the Treaty, international agreements with third countries which are members of COST, particularly the member countries of EFTA and the countries of Central and Eastern Europe, with a view to associating them with the whole programme or a part of it.

2. Where framework agreements for scientific and technical cooperation have been concluded between the Community and European non-member States, bodies and enterprises established in those countries may, in accordance

with the procedure laid down in Article 6 and on the basis of the criterion of mutual benefit, be allowed to become partners in a project undertaken within the programme.

No contracting body based outside the Community and participating as a partner in a project undertaken under the programme may benefit from Community financing for this programme. The body concerned shall contribute to the general administrative costs.

Article 9

This Decision is addressed to the Member States.

Done at Luxembourg, 7 June 1991.

For the Council
The President
R. STEICHEN

ANNEX I

SCIENTIFIC AND TECHNICAL OBJECTIVES AND CONTENT OF THE PROGRAMME

The guidelines, scientific and technical objectives and underlying purposes of the third framework programme form an integral part of this specific programme.

Paragraph I.1.B of Annex II to the said framework programme forms an integral part of this specific programme.

On this basis and in the light of the above, there follows an analytical description of the contents of this specific programme.

This specific programme focuses on eight priority areas (including the provision of verification techniques and facilities) in which European collaboration between two or more telecommunications sector organizations is in the common interest. The priority areas are:

AREA 1: IBC (integrated broadband communications) R&D

AREA 2: Intelligence in networks/Flexible communications resource management

AREA 3: Mobile and personal communications

AREA 4: Image and data communications

AREA 5: Integrated services technologies

AREA 6: Information security technologies

AREA 7: Advanced communications experiments

AREA 8: Test infrastructures and interworking (horizontal R&D area supporting the other priority areas).

Work carried out on each of these areas will be of three types; the work will cover: development of implementation strategies for IBC systems, services and applications; advanced communication technologies, and validation of standards and common functional specifications for IBC. It will involve the use of experimental equipment and services to address generic applications.

AREA 1: IBC (integrated broadband communications) R&D

Integrated broadband communications technology forms the backbone for advanced services and largely determines their costs. Key technologies, systems, services and applications are being addressed under this IBC R&D heading using a systems approach. This area builds on and extends the work of the RACE I programme and in so doing focuses on the following subjects:

IBC systems design, architecture and operation

This work, based on a set of 'open' standards allowing universal access to integrated services, will enable integrated broadband communications to accommodate emerging new services. In order for the various organizations concerned to define their requirements clearly, reference models and common functional specifications will be systematically developed. Special emphasis will be given to examining the combination and interaction of different technical options, evaluating the demand for basic and enhanced services and addressing the impact of regulations.

IBC transition strategies

The transition leading to IBC services from current services requires the improvement of interoperability between public and private networks with regard to new services. This work is essential for user acceptance of these new services and the optimum use of communications resources.

Research under this heading will include further development of common functional specifications and reference configurations, with close attention to recent developments. Particular attention will be given to the increased role of optical communications (taking into account the growing interest in 'fibre-to-the-home'), the emergence of synchronous/asynchronous transport switching techniques, the integration of mobile communication sub-systems (especially in rural areas) and the development of intelligence in the networks. Work will also be carried out on the definition of new value-added services adapted to evolving needs and their consequences on the management of local area networks. Specific tasks to be addressed will cover image communication and its integration in services; and the interworking between private networks, local and metropolitan area networks.

Common operational environment

This work aims at supporting standardization efforts, particularly those of the European Telecommunications Standards Institute (ETSI). It will include the dissemination of results, the seeking of outside information, and liaison with similar activities conducted in other fora. Common analytical tools will be developed and used for the transition and implementation scenarios for the IBC network.

Techniques for basic IBC system functions

This work will cover switching systems, integrated optical systems and networks, IBC customer systems and IBC software infrastructures.

Switching systems: The technology base of asynchronous transfer mode (ATM) will be broadened and interworking techniques between ATM networks and pre-existing networks will be developed. The work will enable ATM switching technology to support connectionless services and the interconnection of local area networks (LANs) and metropolitan area networks (MANs). This development of ATM does not exclude basic research on new switching technologies or designs.

Integrated optical systems and networks: The work will provide the basis for low-cost broadband access networks and contribute to the introduction and evolution of integrated optical networks and photonic switching.

IBC terminals: In the study on access of business IBC subscribers, data processing requirements will be examined; for domestic access, communication protocols will be of most interest.

IBC software infrastructure: The research will support the cost-effective development of reliable telecommunications software and its full life-cycle support. Parameters such as software quality assurance and artificial intelligence will be taken into account. The research will also cover investigations of knowledge-based systems for life-cycle support.

Integration of IBC demonstrators

Interoperability characteristics and integration possibilities of 'technology demonstrators' will be verified for residential or business use and, where applicable, in both urban and rural areas. The research will validate the application feasibility of new technology, support standardization and provide the basis for the evaluation of the performance level of systems and services. It will cover the integration of access, transport and switching functions as well as control, management and signalling functions. Demonstrators of IBC terminals, as well as terminals developed elsewhere, will be connected in order to illustrate the large variety of terminals and services that can be supported.

Verification tools

Work in this area will involve the development of the necessary tools to verify functional specifications and compatibility of equipment. The tools will consist, in addition to the necessary facilities for physical verification, of the procedures and descriptions used to carry out such verification.

AREA 2: INTELLIGENCE IN NETWORKS/FLEXIBLE COMMUNICATIONS RESOURCE MANAGEMENT

This research will be related to the use of new techniques of information transfer, optical communications, and possibly artificial intelligence, for enhancing flexibility, both in the provision of new network services and network management.

The objective of this work will be to enable second generation systems to be developed and to contribute to standardization and definition of interconnection protocols.

This research will be related to the development and demonstration of techniques needed for the introduction of programmable networks and will cover the aspects of provision of new services, operations support systems (OSS) and telecommunications management networks (TMN).

AREA 3: MOBILE AND PERSONAL COMMUNICATIONS

Research in this area will contribute to the development of third generation integrated mobile communication systems. The aim will be to provide universal personal communications using audio, data and image. For cost-efficient implementation third generation systems will require a common radio-interface. They will exploit the microwave frequency ranges of 2 GHz, but certain mobile broadband services will require exploitation of the 60 GHz range. This work will focus on defining the functional specifications for IBC and radio networks (e.g. interconnection standards and mobility management). Interest will also be shown in the miniaturization of

terminals. The terminals should be cost-effective for business and domestic use, with particular emphasis on low power consumption and efficient use of frequencies. Close attention will be given to the needs of different kinds of users and especially the requirements of pan-European access, necessitating truly compatible services and protocols.

AREA 4: IMAGE AND DATA COMMUNICATIONS

The research will involve the development of the technologies needed for the introduction and exploitation of advanced, low-cost and flexible image and data communication services, for both business and domestic needs. It will build on the foundations established by RACE, addressing in particular the impact of new transfer modes (such as ATM) on high-resolution visual services and fast packet data transmission at megabit rates. The work will concentrate on digital HDTV and will include coding and presentation techniques for still, moving and three-dimensional images. It will cover the interworking between an IBC system and the other networks with which it will co-exist.

AREA 5: INTEGRATED SERVICES TECHNOLOGIES

The development of demand in the field of services requires that the communications systems must be able to develop dynamically responding to end-user wishes. This field of study is defined below.

The objective of this research is to contribute to the definition of common functional specifications for new communication services and multimedia-systems. Notably, work will have to be done on specifications for use and more generally on services design and on their links with networks.

IBC/Modular standardization

This work will contribute to the harmonization of architectures and specifications for the flexible integration of telematic services under user control. Due account will be taken of the trans-national scale of communication needs and the heterogeneous technical environment.

Service engineering will focus on modular standardization in the areas of architectures, service-user components, service-provider components and service-creator components. It will also cover service harmonization and usage modelling.

It will address the functional architecture of an integrated-services environment and the specification of the components and primitives for end-user applications. Research into usability will focus on the human-service interface and include the design of generic metaphors for integrated services access. The work on service-provider components will cover specifications for service management: the work on service-creator components will develop definitions of specifications of common tools for service creation. The harmonization efforts will be directed in particular towards a definition of specifications for usability and the definition of quality of service parameters. Specifications for mobile communication and for security requirements will also be studied. Usage modelling will enable problems linked to such use to be studied and in particular the factors concerning the acceptance of a service by users.

Integrated service technologies

This research will build on system engineering activities, and the results will contribute to the specification and harmonization work. It will address techniques for architecture realization, user components technologies, metaphors and user interface technologies, and service management systems.

Service technology verification

The research will involve the development of prototype facilities for flexible integration of services responding to the requirements of operators, service providers and users.

AREA 6: INFORMATION SECURITY TECHNOLOGIES

The accuracy, security and overall 'trustworthiness' of electronically-communicated information are evidently of great importance to private individual, commercial undertakings and industry and public administrations. Work in this area will ensure that considerations of quality, security and reliability of service are included in their development and implementation strategies for advanced communications. It will provide validated specifications, guidelines and technology for practical and effective information security at a pan-European level consistent with actions which are carried out in the other specific programmes. The priority in this area is to develop technologies for information security, consistent with actions related to information systems security undertaken by the Commission under various programmes for which it is responsible.

Service quality, security and reliability

The research will cover risk management, coherent security solutions and the creation of a favourable environment for secure information management.

Risk management: A common strategy will be developed to allow the rational management of risks. It will provide the scientific basis for legal measures to reduce risks.

Coherent security solutions: Coordinated strategies will be developed to guarantee the interworking of separate security mechanisms/procedures. They will allow shared scenarios for transition to be developed, especially in public security infrastructures. The work will provide the basis for collaboration between organizations on the security of information exchanged between them.

Creation of a favourable environment: Options for the diffusion of information security techniques and related measures will be identified. The actual diffusion of solutions amongst end users is outside the scope of this programme.

Information security technologies

Technologies for security mechanisms and technologies for the integration of secure systems will be investigated, especially for distributed systems. They will be addressed under the following major headings:

Systems technologies for information security: addressing usability, auditability, applications software, hardware and operating systems.

Network technologies for information security: covering both transmission and switching.

Tools for the administration of information security: involving the development of software tools incorporating methods for the administration of information security. The research will address the analysis of risks, the formulation and implementation of information security policies, and the on-going administration of routines and quality-assurance of security systems.

Information security verification

The architectures, specifications and the technologies developed under this specific programme will be verified by building a series of demonstrators. This is essential in order to obtain genuine information security since the security of any system can only be as good as its weakest link and the systems studied in this context are complex. The work will fall under the following major headings:

Integration of information security technologies: addressing the use of a mix of several technologies for achieving optimal information security (ranging from electronics to suppress unwanted radiation of signals to protocol designs). These technologies cover many functions and form the constituent elements of the overall systems.

Verification of common tools for information security: covering three classes of tools; risk analysis tools, assurance criteria tools and tools for assessment of security.

Establishment of common infrastructure for information security: covering four areas: certification services for security products; accreditation services for secure systems; gateways for secure international traffic; and third-party security services. In all areas, the work will involve pilot schemes. These will be adapted to the needs of different branches of the economy, including public administrations, and directly supported by those who have developed the technologies within the R&D projects, in this programme or outside.

AREA 7: ADVANCED COMMUNICATION EXPERIMENTS

This pre-competitive and pre-standardization work is designed to prepare the ground for, and minimize the risks of investments in, advanced communications. It will identify generic service functions which are reusable and will permit the matching of different user needs while maintaining universal access and interoperability. The research will make it easier for user organizations to take up new technologies more rapidly and exploit the opportunities they present. By contributing to the creation of demand for advanced communications, work in this area is also in the interest of telecommunications operators and equipment manufacturers. The work focuses on the following subjects:

Study of generic functions

The research will focus on the identification of 'trigger' applications of advanced communications and of the generic applications which will be the basis for a spectrum of future universal services. It will cover the development of a usage reference model, development of consensus-based operational and functional specifications for services, consolidation of network and technology aspects and the identification of criteria and guidelines for the successful introduction and use of advanced communications. The work on the usage reference model will build on the

pre-existing concepts, but with a new focus on entry strategies, generic applications and the relation between applications (the user/demand viewpoint) and services (the provider/supplier viewpoint). Consensus-based operational specifications, with user participation and common functional specifications for services will be developed where they are 'market enabling'. The identification of criteria and guidelines for the successful introduction and use of advanced communications will build on application experiments, relating to applications with a strong socio-economic impact. Some generic applications have already been identified: examples are distributed case handling, inter-personal communications and remote delivery of expertise.

Technology and techniques for advanced communications experiments

The technology and techniques necessary for experimentation with advanced applications will be addressed under this heading. Three themes have been identified: development and identification of technologies to support the development of the service infrastructures; development of techniques to support the elicitation of user requirements and responses to be made to satisfy these requirements. The work will include the identification of server modules required for applications such as translation/interpretation, integrity, multimedia conferences, multimedia databases and distribution. The modelling of user requirements will cover service and product elements, network capabilities (transport, switching and management) and terminal facilities, implemented in hardware or software. The development of techniques enabling the exploitation of responses to such requirements will concern in particular support for the demand reference process. Large-scale field experiments will be complemented by simulation techniques. Presentation techniques, including animation and graphics, will be used to complement detailed technical reporting.

Application experiments

The technical and economic future of subsequent feasibility applications of broadband communications will be verified by experiments. The experiences will enable one to identify, describe, model and define generic applications of advanced communications that cross business sectors and functions for all regions of the Community. Network operators and users will be able to draw on the results of these experiments to put together marketing and exploitation plans. A certain amount of equipment (including service and product elements) will be developed for generic applications, allowing sector-specific application experiments to be undertaken.

The work will take account of the future needs of users, confirm the existence of these generic applications and clarify their characteristics in field experimentation. The resulting knowledge will form a basis for the relevant telecommunications sector organizations in planning the standardization, implementation and operation of future communications networks.

AREA 8: TEST INFRASTRUCTURE AND INTERWORKING

The successful introduction of IBC services in Europe needs to be preceded by experimentation and trials. A test infrastructure is therefore necessary, connecting those involved. It is needed to validate standards and functional specifications. Under conditions to be agreed on by the partners the provision and operation of the test infrastructure is expected to be ensured by the operators and national test-beds, in collaboration and cooperation between them when necessary for interconnection and interworking. These national test-beds working in cooperation would provide the basis for the communications experiments. Correspondingly this area supports work required to establish interworking.

ANNEX II

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

(in million ecus)

Area	Breakdown
1. IBC (integrated broadband communications) R&D	111
2. Intelligence in networks Flexible communications resource management	43
3. Mobile and personal communications	53
4. Image and data communications	68,11
5. Integrated services technologies	39
6. Information security technologies	29
7. Advanced communications experiments	121
8. Test infrastructures and interworking (horizontal R&D area supporting the other priority areas)	20
	Total 484,11 ⁽¹⁾ ⁽²⁾

⁽¹⁾ Including expenditure on staff which amounts to ECU 19,36 million and administrative expenditure amounting to ECU 21,64 million.

⁽²⁾ An amount of ECU 4,89 million, not included in the ECU 484,11 million, will be earmarked as the contribution from this specific programme to the centralized scheme for the dissemination and exploitation of results.

The breakdown between different headings does not exclude the possibility that projects could come under several headings.

ANNEX III

RULES FOR IMPLEMENTING THE PROGRAMME

1. The Commission will implement the programme on the basis of the objectives and the scientific and technical content described in Annex I.
2. The rules for implementing this programme, referred to in Article 3, comprise research and technological development projects, accompanying measures and concerted action projects. Selection of projects must take account of the criteria listed in Annex III to Decision 90/221/Euratom, EEC and of the objectives defined in Annex I to this Decision.

— Research projects

The projects will be the subject of shared-cost research and technological development contracts, with Community financial participation not normally exceeding 50 %. Universities and other research centres participating in shared-cost projects will have the option of requesting, for each project, either 50 % funding of total expenditure or 100 % funding of the additional marginal costs.

Shared-cost research projects must, as a general rule, be carried out by participants established within the Community. Projects in which, for example, universities, research organizations and industrial firms, including small and medium-sized enterprises, may take part must provide, as a general rule, for the participation of at least two partners, independent of each other and established in different Member States. Contracts relating to shared-cost research projects must as a general rule be concluded following a selection procedure based on calls for proposals published in the *Official Journal of the European Communities*.

— Accompanying measures

The accompanying measures referred to in Article 7 of this Decision will consist of:

- the organization of seminars, workshops and scientific conferences,
- internal coordination through the creation of integrating groups,
- advanced technology training programmes, with emphasis being placed on multidisciplinary,
- promotion of the exploitation of results,
- independent scientific and strategic evaluation of the operation of the projects and the programme.

— Concerted action projects

Concerted action projects consist of action by the Community to coordinate the individual research activities carried out in the Member States. They may benefit from funding of up to 100 % of coordination expenditure.

3. The knowledge acquired in the course of the projects will be disseminated both within the specific programme and by means of a centralized activity, pursuant to the Decision referred to in the third subparagraph of Article 4 of Decision 90/221/Euratom, EEC.

COUNCIL DECISION

of 7 June 1991

adopting a specific programme of research and technological development in the field of telematic systems in areas of general interest (1990 to 1994)

(91/353/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 130a (2) thereof,

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

In cooperation with the European Parliament ⁽²⁾,

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

Whereas, by Decision 90/221/Euratom, EEC ⁽⁴⁾, the Council adopted a third framework programme for Community activities in the field of research and technological development (1990 to 1994), specifying *inter alia* the activities to be pursued for developing the scientific knowledge and technical know-how needed by the Community, in particular to carry out its role in the field of telematic systems in areas of general interest; whereas this Decision should be taken in the light of the grounds set out in the preamble to that Decision;

Whereas Article 130k of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity;

Whereas basic research must be encouraged as far as is necessary throughout the Community in each strategic sector of research in the framework programme;

Whereas in addition to the specific programme concerning human resources and mobility, it might be necessary to encourage the training of research workers in the context of this programme;

Whereas, in the context of this programme, an assessment should be made of economic and social impact as well as of any technological risks;

Whereas, pursuant to Article 4 of and Annex I to Directive 90/221/Euratom, EEC, the amount deemed necessary for the whole framework programme includes an

amount of ECU 57 million for the centralized dissemination and exploitation of results, to be divided up in proportion to the amount envisaged for each specific programme;

Whereas Decision 90/221/Euratom, EEC provides that a particular aim of Community research must be to strengthen the scientific and technological basis of European industry, particularly in strategic sectors of advanced technology, and to encourage it to become more competitive at the international level; whereas it also provides that Community action is justified where research contributes, *inter alia*, to the strengthening of the economic and social cohesion of the Community and to the promotion of its overall harmonious development, while being consistent with the pursuit of scientific and technical excellence; whereas the programme of research in the field of telematic systems should contribute to the achievement of these objectives;

Whereas small and medium-sized enterprises should be involved to the maximum extent possible in this programme; whereas account should be taken of their special requirements without prejudice to the scientific and technical quality of the programme;

Whereas research/development in the field of telematic systems in areas of general interest will contribute to the successful completion of the internal market and at the same time improve the performance of large public services facing, throughout the Community, the new technological, social and economic challenges which are implied by European integration;

Whereas it is important, when projects are selected, to ensure that data are protected and confidentiality maintained;

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

HAS ADOPTED THIS DECISION:

Article 1

A specific research and technological development programme for the European Economic Community in the field of telematic systems in areas of general interest, as defined in Annex I, is hereby adopted for a period beginning on 7 June 1991 and ending on 31 December 1994.

⁽¹⁾ OJ No C 174, 16. 7. 1990, p. 19.

⁽²⁾ OJ No C 324, 24. 12. 1990, p. 271; and OJ No C 158, 17. 6. 1991.

⁽³⁾ OJ No C 41, 18. 2. 1991, p. 6.

⁽⁴⁾ OJ No L 117, 8. 5. 1990, p. 28.

Article 2

1. The funds estimated as necessary for the execution of the programme amount to ECU 376,2 million, including expenditure on staff and administration amounting to ECU 41 million.
2. An indicative allocation of funds is set out in Annex II.
3. Should the Council take a decision in implementation of Article 1 (4) of Decision 90/221/Euratom, EEC, this Decision shall be adapted accordingly.

Article 3

Detailed rules for the implementation of the programme and the amount of the Community's financial contribution are set out in Annex III.

Article 4

1. In the second year of implementation of the programme, the Commission shall review it and send a report on the results of its review to the European Parliament and the Council; the report shall be accompanied, where necessary, by proposals for amendment of the programme.
2. At the end of the programme, an evaluation of the results achieved shall be conducted for the Commission by a group of independent experts. This group's report, together with any comments by the Commission, shall be submitted to the European Parliament and the Council.
3. The reports referred to in paragraphs 1 and 2 shall be established having regard to the objectives set out in Annex I to this Decision and in accordance with Article 2 (4) of Decision 90/221/Euratom, EEC.

Article 5

1. The Commission shall be responsible for the implementation of the programme.
2. Contracts concluded by the Commission shall govern the rights and obligations of each party, in particular the arrangements for the dissemination, protection and exploitation of research results, in accordance with the provisions adopted pursuant to the second paragraph of Article 130k of the Treaty.
3. A work programme shall be drawn up in accordance with the aims set out in Annex I and updated where necessary. It shall set out the detailed objectives and types of projects to be undertaken, and the financial arrangements to be made for them. The Commission shall make calls for proposals for projects on the basis of the work programme.

Article 6

1. The Commission shall be assisted by a committee composed of representatives of the Member States and chaired by the representative of the Commission.

2. The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion within a time limit which the chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority provided for in Article 148 (2) of the EEC Treaty as regards adoption of decisions which the Council is required to adopt on a proposal from the Commission. When the committee votes, the votes of the representatives of the Member States shall be weighted as laid down in the abovementioned Article. The chairman shall not vote.

3. The Commission shall adopt the proposed measures when they are in accordance with the committee's opinion.

4. When the proposed measures are not in accordance with the committee's opinion, or where no opinion is delivered, the Commission shall submit to the Council without delay a proposal concerning the measures to be taken. The Council shall act by a qualified majority.

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

Article 7

1. The procedure laid down in Article 6 shall apply to:
 - the preparation and updating of the work programme referred to in Article 5 (3),
 - the contents of the calls for proposals,
 - the assessment of the projects provided for in Annex III and the estimated amount of the Community's contribution to them where this amount exceeds 1 % of the amount deemed necessary for each field referred to in Annex II,
 - departures from the general rules set out in Annex III,
 - the participation in any project by non-Community organizations and enterprises referred to in Article 8 (1) and (2),
 - any adaptation of the indicative allocation of the amount set out in Annex II,
 - the measures to be undertaken to evaluate the programme,
 - arrangements for the dissemination, protection and exploitation of the results of research carried out under the programme.

2. Where, pursuant to the third indent of paragraph one, the amount of the Community contribution is less than or equal to 1 % of the amount deemed necessary for the projects, the Commission shall inform the committee of the projects and of the outcome of their assessment.

The Commission shall also inform the committee of the implementation of the accompanying measures and the concerted actions referred to in Annex III.

Article 8

1. The Commission is authorized to negotiate, in accordance with Article 130n of the Treaty, international agreements with third countries which are members of COST, particularly the member countries of EFTA and the countries of Central and Eastern Europe, with a view to associating them with the whole programme or a part of it.

2. Where framework agreements for scientific and technical cooperation have been concluded between the Community and European non-member States, bodies and enterprises established in those countries may, in accordance with the procedure laid down in Article 6 and on the basis of the criterion of mutual benefit, be allowed to become partners in a project undertaken within the programme.

No contracting body based outside the Community and participating as a partner in a project undertaken under the programme may benefit from Community financing for this programme. The body concerned shall contribute to the general administrative costs.

Article 9

This Decision is addressed to the Member States.

Done at Luxembourg, 7 June 1991.

For the Council
The President
R. STEICHEN

ANNEX I

OBJECTIVES AND SCIENTIFIC AND TECHNICAL CONTENT

The guidelines, scientific and technical objectives and underlying purposes of the third framework programme form an integral part of this specific programme.

Paragraph I.1.C of Annex II to the framework programme forms an integral part of this specific programme.

On this basis and in the light of the above, there follows an analytical description of the contents of this specific programme.

Introduction

In pursuit of the objectives outlined in the technical Annex to the framework programme, special account will be taken of the needs for management and transmission of electronic information as a consequence of completion of the single European market. These needs will be identified in collaboration with users: public authorities, businesses in manufacturing or service industries, academic institutions and individuals.

The activities will be pre-competitive and pre-normative and will concentrate on providing opportunities for interoperability between national systems, for defining standards, architectures and functional specifications. The activities will address such issues as user acceptance, security and privacy.

Pilot projects and demonstrators will be included when it can be shown there is a need to verify technology, to demonstrate interoperation standards and where there is broad interest to all Member States.

Close coordination will take place between these activities and those within lines 1.A and 1.B of the third framework programme as well as those outside the framework programme such as Eureka projects.

AREA 1: SUPPORT FOR THE ESTABLISHMENT OF TRANSEUROPEAN NETWORKS BETWEEN ADMINISTRATIONS

The objective of this area is to define common requirements for electronic information exchange and to examine the need for interoperability between electronic information networks within Member States; to carry out studies and pre-normative research for the definition and subsequent establishment of the trans-European telematic services networks essential to national administrations for the completion of the single market, for the provision of the services necessary to the free movement of persons, goods, services and capital and for increasing economic and social cohesion in the Community.

The priority subareas are those most closely linked to the completion of the internal market. In the first instance, work may concern such areas as customs, social services, emergency services and statistics. Several examples are given below.

With the elimination of frontiers within the Community as a result of the completion of the internal market, it will no longer be possible to monitor goods in transit at national frontier posts. Monitoring of goods in transit will require information to be exchanged between the customs of the country in which the goods enter or leave Community territory and the country of destination or origin of the goods. Consideration should therefore be given to whether, and how far, this will create a new need which new IT and telecommunication tools can help to satisfy.

Free movement of goods within the Community requires means of controlling their movements. Furthermore, the problems due to the incompatibility of existing national systems and to relations with non-Community countries, legal constraints and differing procedures and methods must be surmounted. Freedom of movement for persons cannot be achieved without a sustained, two-way flow of information between the various administrative establishments with responsibility for social services. Telecommunications interconnection between these administrations should help to provide social services for people. The setting-up of trans-European telematic services could help to do this, by ensuring rapid and secure information exchange, guaranteeing the compatibility of operational procedures while respecting citizens' rights, and promoting international coordination.

The interconnection and interoperability of existing statistical tools will allow the implementation of a European system of statistical information.

Identification of needs and implementation strategies

Selected areas closely linked to the completion of the single market will be examined in an exploratory action. This will comprise an assessment of the exchange of electronic information brought about by the completion of the single European market, an assessment of the needs of the users of this information to accommodate these changes and an assessment of the role of research and development in meeting these needs. The results of this work will enable the relevant administrations of the Member States and the Commission, with the help of hardware and software producers, telecommunications operators, and possibly service providers, to seek a consensus on the functional and technical specifications of the services required and strategies for setting up the transeuropean networks to provide these services.

The comparison of these descriptions with needs should enable the work remaining to be done to be identified by mutual agreement; this may involve some or all of the following tasks: description of the information desired, precise description of the types of messages required (free text, statistical tables or highly structured administrative messages), their format, the functional specifications and standards to be used, adapted or developed, as appropriate, and the protocols to be developed or converted.

Preference will be given to systems which are designed to intercommunicate using key elements, particularly those which have been standardized at European or world level. The standards relating to database access, storage and access protocols, languages, etc., will be identified and adapted where necessary. Arrangements must be made to ensure secure services.

Development of the technologies relating to telematic services and validation of common functional specifications

In order to take account of the complexity of these networks of services, the number of parties involved, the variety of information, real-time or batch processing, and capacity requirements, the architectures and the management of these trans-European networks will have to be thoroughly studied and researched in order to achieve the performance and reliability required to satisfy the specific needs of each administration. These studies and research will have to be carried out jointly by users of specialized networks, manufacturers of information and communications equipment, telecommunications operators and possibly service providers.

The work will concentrate initially on interoperability, common standards, architectures and functional specifications, user acceptability, data integrity and confidentiality. As a result of this work, a common reference model should be developed for the implementation or the adaptation of the telematic systems which are proposed. The results of the exploratory activities in a few subareas will be taken into account as work in this area is subsequently broadened.

This work will complement that conducted in the specific programmes on IT and communications.

To obtain the interoperability of computerized service networks, used by the administrations and end-users, it is important to verify common functional specifications. Special attention will be paid to the quality, reliability, security and ease of use of these services. To this end, a limited number of pilot projects will be carried out where there is a need to verify functional specifications and technology, where there is a general interest to all Member States and where this is in keeping with rules on personal data protection.

Where appropriate these experimental development activities will be carried out in cooperation with the work carried out under the Insis, Caddia and Tedis programmes and certain parts of the Esprit and RACE programmes.

AREA 2: TRANSPORT SERVICES

The activities aim to contribute to the development, in the field of transport, of integrated trans-European services using advanced IT and communications to improve the performance (safety and efficiency) of passenger and goods transport services, and at the same time reduce the impact of transport on the environment. (See under 'road transport'.)

Account will have to be taken of the peculiarities and specific needs of the various parties involved, notably private and business users and administrations. Safety and ease of access for all users will be given special attention.

Road transport (Drive)

The objective is to contribute to development of a framework in which advanced IT and communications can be harnessed to improve the efficiency and safety of passenger and goods transport and reduce their impact on the environment. The work will build on the exploratory research in Drive under the second framework programme. There will be close liaison with relevant Eureka projects.

Work in this area should cover the interface between road and rail transport as well as that between road and sea transport.

The work will concentrate on the needs of users, those concerned with safety, provision and maintenance of infrastructure and provision of transport services.

The activities will be divided into three interactive parts: the definition of functional specifications in the context of a strategy for the use of technology and telematic systems for communication and traffic control, the development of new technologies and experimental systems, and validation work.

Strategies for the use of technologies, telematic services and systems and contribution to the definition of common functional specifications

The results of the work carried out so far under the Drive and relevant Eureka projects have enabled the needs specific to road transport and the technologies and systems available for communications and traffic control to be identified and evaluated. On the basis of these results, a strategy for using these technologies and systems will be sought in cooperation with transport users, business, providers of transport-related services and the administrations concerned.

Systems engineering work will continue on an integrated transport environment, addressing development and implementation strategies. It will help to draw up the functional specifications in terms of equipment, services and operating procedures, and to make recommendations to standard setting authorities such as CEN/Cenelec and ETSI for traffic control, transport management, driver support, road safety.

Technologies and experimental development of systems

The work will take account of the technologies emerging within information and communications, the results of research carried out under Drive and in other activities both in the Community and Member States.

Technologies and experimental systems for managing transport and controlling road traffic will be developed and evaluated for both passenger and goods transport.

Safety and communications systems will concentrate on helping drivers on long journeys. The research will focus on on-board safety systems and equipment able to detect warnings and incidents and communicate with the new fixed infrastructure equipment.

Research and technological development work specific to goods transport, including dangerous goods transport, will also be undertaken. It will cover the software, hardware and telematic systems needed to improve goods traffic management. This work will concern real-time monitoring of the various forms related to transactions, the goods themselves and vehicles; management systems for all kinds of vehicle fleets will also be developed.

In the field of public transport, work on monitoring and control will continue, to evaluate the cost-effectiveness of opportunities for on-line monitoring, scheduling and control for users and providers of services and to establish the necessary functional specifications.

The technological solutions will have to ensure that the telecommunications equipment to be introduced is suited, in terms of size, cost and performance, to the intended specific uses and the needs identified.

Special attention will be given to existing and emerging systems namely those related with satellites and digital cellular communication networks. Of particular importance is the potential of new systems to provide incident detection and provide usable information to network managers and road users through effective road-vehicle communications.

Validation and pilot projects

In order for the new systems and devices to be accepted by both the general public and the relevant authorities, they must be of proven performance and reliability and their potential impact on the environment must be assessed. This will require full-scale pilot experimentation to establish whether technologies serve market needs, contribute significant gains in efficiency (with existing and new-infrastructure) safety and environmental benefits are cost effective and provide satisfactory system security and interoperability. These will be oriented towards the integration of multiple subsystems, functions and services which requires strong pre-standardization efforts. The sector actors should be closely associated with the work.

These experiments will cover areas including integrated urban traffic control; monitoring of air pollution; integrated motorway traffic control; vehicle roadside communications; driver information; transport demand management; public transport; freight transport and trip planning.

The need for rigorous evaluation should be a prime requirement in selection and design of pilot projects which may mean that pilot projects are established on an incremental basis. Projects should also evaluate technologies and systems of wide applicability.

AREA 3: HEALTH CARE (AIM)

The objective of this area is that of stimulating the development of harmonized applications of information and communication technologies in health care and the development of an European health-care information infrastructure taking into account the needs of users and technological opportunities.

The activities will depend on the needs of users and on the requirements of transnational exchange of electronic information. They will concentrate on interoperability of national systems, the establishment of standards, user acceptability, data integrity and confidentiality. The selection of activities will depend on strategic options within both the European health-care sector and European telematics sector.

Work in this area will be carried out along three main lines, making use of the exploratory work of the AIM programme (advanced informatics in medicine) and in close cooperation with other Community programmes.

Strategies for the use of technologies, telematic systems and services and contribution to the definition of common functional specifications

The nature of research and technological development activities will depend to a large extent on user needs and the general constraints associated with the transnational nature of the information infrastructure required. This transnational aspect requires compliance with three principles: integration (notably the emergence of standards); modularity, to facilitate adaptation to different types of needs, and data security. The research and technological development activities will depend on the assessment of technological needs in the light of the main factors affecting the development of health care. They will also depend on the strategic options for European telematic services in the sector. Essential problems such as confidentiality and data protection will be given high priority.

Development of telematic technology applied to medicine

Activities are expected to fall into one or more of the following domains:

- alphanumeric data and text coding standards,
- images and biosignals with coding standards,
- integrated medical instrumentation and devices,
- knowledge based and decision support systems,
- medical use of multi-media workstations,
- health-care communication systems,
- telemedical systems and archiving systems,
- modularity and integration of medical and health information systems,
- regulatory tools and incentives (medical, legal, ethical, economic and social),
- technologies and services for the handicapped and elderly,
- inter-hospital telematics for increased security in distance care and improved management of staff and specialized equipment.

Validation and integration

Pilot applications will be set up to demonstrate and evaluate the innovative nature of using IT and communications in this area. Tests of the applicability of the research and development results and the interoperability of telemedicine services will be conducted.

AREA 4: FLEXIBLE AND DISTANCE LEARNING (Delta)

On the basis of the exploratory work of the Delta programme and in close cooperation with other Community activities such as Comett and Eurotecnet, the work in this area will be carried out in three interdependent parts: drawing-up of implementation strategies, development of technologies and systems, and validation and integration of services.

Strategies for the use of technologies, telematic systems and services and contribution to the definition of common functional specifications

In the light of the interests of the various categories of users and taking account of the technological potentials, the various possible options to satisfy these needs will be identified. The measures needed to overcome the difficulties of implementing educational technologies will be determined.

Systems engineering work will be carried out: it will consist of identifying user needs and then reaching a consensus on specifications and functional standards which satisfy the needs of the various categories of users, producers of educational materials and providers of flexible and distance learning services.

The work will centre on the development of production methods for multimedia educational materials which are portable and transferable between various systems with the prospect of transnational use, including remote assistance and help procedures for the various categories of users.

Development of systems and technologies

The work will relate to the technologies required to obtain a telematic service for local and distance learning which is flexible, effective, modular and interoperable.

It will be necessary to integrate and adapt the information and communications technologies, hardware configurations and protocols for educational and training applications and ensure compatibility and portability of the various systems developed for the potential users, whether they be students, authors, tutors, producers or simply people requesting information on education services.

Experiments on the validation and integration of services

The performance of the various possible services and technical configurations must be evaluated. Experiments in the real environment will allow testing of the value added by interconnecting the various systems using new technologies for education, information and user assistance. The experiments will establish the comparative advantages and the performance, in relation to their cost, of these various configurations of flexible distance learning systems for different categories of users.

AREA 5: LIBRARIES

The objective is to facilitate user access, by optimum use and development of equipment and telematic systems, to the wealth of knowledge held in libraries while reducing the handicaps caused by the present disparate infrastructures in the Community.

To this end, the work will have to help develop modern library services all over the Community by promoting faster, but orderly and cost-effective penetration of new technologies into libraries.

Initial Community activity in this area must be selective, concentrating on urgent problems which can catalyse change in a concrete and practical way. Applied research and development will therefore be used to support the development of appropriate tools, methods and resources which will be able to stimulate modernization of the operational infrastructure and services provided, and facilitate cooperation and resource sharing at national and European levels.

This activity will consist of setting up computerized bibliographies where these are lacking, and helping to improve computerized bibliographies or collective catalogues. Support will also be given to retrospective conversion of catalogues of important collections at international level, by developing the necessary tools and methods.

Projects will be set up to facilitate the international interconnection of the systems managing these basic data for particular functions (shared cataloguing, inter-library loans, etc.) and thus help to prepare and apply a range of international or European standards.

The provision of new library services using IT and communications in small units will be stimulated. Initial support will be given to the creation of a range of innovative experimental services for library users, taking account of the different levels of development of library services in the Member States.

Finally, projects will be set up to encourage the development of a European market in telematic products and services specific to libraries. Interaction between libraries and IT industries will be stimulated by improving the definition of libraries' needs which new IT and communications can satisfy. Limited initial support will be given to experimental demonstrations of products (such as software) and services.

AREA 6: LINGUISTIC RESEARCH AND ENGINEERING

The aim of this area is to develop a basic linguistic technology which can be incorporated into a large number of computer applications where natural language is an essential ingredient, with a view to accommodating or overcoming limitations and inefficiencies within the Community brought about by different natural languages. This requires the creation of linguistic resources (grammars, dictionaries, terminology collections and corpora of text) for the nine official Community languages, and the definition of standards for these data. A number of pilot applications and demonstration projects will be undertaken to show how the technology will be used and demonstrate the technical and economic feasibility of the solutions adopted.

The area is divided into three parts: research, development of resources and pilot applications. It is based on the results and experience drawn from Eurotra and certain specific projects conducted under Esprit and national research programmes.

The research work will concentrate on the development of a common computer-based linguistic model for text representation in different languages and on the pursuit of automated techniques for reducing the number of possible interpretations of a given text. The development of advanced computational technologies will encourage the application, for linguistics, of progress made in the field of advanced expert systems, database technologies, speech processing and computer architectures. It is also intended to create methods, tools and linguistic resources, especially portable software tools, grammars, dictionaries, domain specific terminological collections, as well as large, high/ quality corpora and the stimulation of standards work. Pilot applications and demonstration projects will help to test the progress of research work and to demonstrate the technical and economic feasibility of tools, methods and resources in an operational environment.

AREA 7: TELEMATICS SYSTEMS FOR RURAL AREAS

Half the European population still lives outside major cities and towns, and rural areas need comparable telematic service infrastructures to those in urban centres if they are to develop more balanced economic activities with a greater diversity of employment. The introduction of such services in rural areas will be a gradual process, the investments required will be large, and the infrastructures installed will have a lifetime of some decades. It is therefore essential that the right choices are made on technologies and system configurations. There is a need for pre-normative actions to harmonize the Community markets for equipment and services adapted to the needs of rural areas; for development and stimulation of specialised services and for the impacts of telematics in rural areas to be consistently assessed.

Community action in this area will contribute to completion of the single market, to strengthening the socio-economic cohesion of Europe, to improvements in the quality of life in rural areas, to industrial innovation (in particular for small and medium-sized enterprises) and to rural development. The actions will be part of a wider programme of actions strengthening rural development in the Community.

The goal is to create the conditions for geographically dispersed small businesses to provide more diverse employment opportunities and a more balanced economic activity in rural areas; to establish a basis for provision of improved services to dispersed and isolated populations, to raise the level of awareness of the potential of information and communication technologies in rural areas; to encourage manufacturers and service providers to make equipment and services easier to use by rural communities, and to ensure that applications of information and communication technologies in rural areas do not contribute to a further centralization of business and administrative activities and a loss of the cultural and economic diversity of rural areas in Europe.

The specific objectives are to develop a better understanding of the common needs and opportunities for telematic services and of the impacts of such services on rural life; to establish a common understanding of network configuration requirements and options and a common understanding of service requirements for telematic services, and to prepare the way for the harmonized planning and introduction of telematic service infrastructures in rural areas.

In order to achieve these objectives, the actions will involve consensus development with industry and rural development agencies; identification of needs and opportunities for telematics services and assessment of their impacts; specification of service and technology requirements; development of telematic systems, some pilot applications and research on infrastructure planning and implementation strategies.

ANNEX II

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

(in million ecus)

Area	Breakdown
1. Administrations	41,3
2. Transport	124,4
3. Health care (including the handicapped and elderly)	97
4. Flexible and distance learning	54,5
5. Libraries	22,5
6. Linguistics	22,5
7. Rural areas	14
	Total 376,2 ⁽¹⁾ ⁽²⁾

⁽¹⁾ Including expenditure on staff which comes to ECU 30 million and administrative expenditure totalling ECU 11 million.

⁽²⁾ An amount of ECU 3,8 million, not included in the ECU 376,2 million will be earmarked as the contribution from the specific programme in the field of telematic systems in areas of general interest to the centralized scheme for the dissemination and exploitation of results.

The breakdown between different headings does not exclude the possibility that projects could come under several headings.

ANNEX III

RULES FOR IMPLEMENTING THE PROGRAMME

1. The Commission will implement the programme on the basis of the scientific and technical content described in Annex I.
2. The rules for implementing the programme, referred to in Article 3, comprise research and technological development projects, accompanying measures and concerted actions:

— Research projects

The projects will be the subject of shared-cost research and technological development contracts. Selection of projects must take account of the criteria listed in Annex III to Decision 90/221/Euratom, EEC and of the objectives set out in Annex I to this programme.

For shared-cost projects Community financial participation will not normally be more than 50 %. Universities and other research centres participating in shared-cost projects will have the option of requesting, for each project, either 50 % funding of total expenditure or 100 % funding of the additional marginal costs.

Shared-cost research projects must, as a general rule, be carried out by participants established within the Community. Projects in which, for example, universities, research organizations and industrial firms, including small and medium-sized enterprises, may take part must provide, as a general rule, for the participation of at least two partners, independent of each other and established in different Member States. Contracts relating to shared-cost research projects must as a general rule be concluded following a selection procedure based on calls for proposals published in the *Official Journal of the European Communities*.

The Commission will publish a vade-mecum setting out all the rules applying to the selection of projects, in order to guarantee full transparency.

— Accompanying measures

the accompanying measures referred to in Article 7 will consist of:

- the organization of seminars, workshops and scientific conferences,
- internal coordination through the creation of integrating groups,
- advanced technology training programmes, with emphasis being placed on multidisciplinary,
- promotion of the exploitation of results.
- independent scientific and strategic evaluation of the operation of the projects and the programme.

— Concerted actions

Concerted actions consist of action by the Community to coordinate the individual research activities carried out in the Member States. They may benefit from funding of up to 100 % of coordinating expenditure.

3. The knowledge acquired in the course of the projects will be disseminated both within the specific programme and by means of a centralized activity, pursuant to the Decision referred to in the third subparagraph of Article 4 of Decision 90/221/Euratom, EEC.
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COUNCIL DECISION

of 7 June 1991

adopting a specific research and technological development programme in the field of the environment (1990 to 1994)

(91/354/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 130q (2) thereof,

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

In cooperation with the European Parliament ⁽²⁾,

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

Whereas, by Decision 90/221/Euratom, EEC ⁽⁴⁾, the Council adopted a third framework programme for Community activities in the field of research and technological development (1990 to 1994), specifying *inter alia* the activities to be pursued for developing the scientific knowledge and technical know-how needed by the Community, in particular to carry out its role relating to the environment according to Part Three, Title VII of the Treaty; whereas this Decision should be taken in the light of the grounds set out in the preamble to that Decision;

Whereas Article 130k of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity;

Whereas the Joint Research Centre (JRC) shall contribute through its own programme to the implementation of the aforesaid activities;

Whereas basic research in the environment field must be encouraged throughout the Community;

Whereas in addition to the specific programme concerning human resources and mobility, it might be necessary to encourage the training of research workers in the context of this programme;

Whereas, in the context of this programme, an assessment should be made of economic and social impact as well as of any technological risks;

Whereas, pursuant to Article 4 of and Annex I to Decision 90/221/Euratom, EEC, the amount deemed necessary for

the whole framework programme includes an amount of ECU 57 million for the centralized dissemination and exploitation of results, to be divided up in proportion to the amount envisaged for each specific programme;

Whereas Decision 90/221/Euratom, EEC provides that a particular aim of Community research must be to strengthen the scientific and technological basis of European industry and to encourage it to become more competitive at the international level; whereas it also provides that Community action is justified where research contributes, *inter alia*, to the strengthening of the economic and social cohesion of the Community and to the promotion of its overall harmonious development, while being consistent with the pursuit of scientific and technical excellence; whereas the programme in the environment field is looked upon as contribution to the achievement of these objectives;

Whereas small and medium-sized enterprises (SMEs) should be involved to the maximum extent possible in this programme; whereas account should be taken of their special requirements, without prejudice to the scientific and technical quality of the programme;

Whereas it might be advisable to allow bodies and enterprises established in third countries to take part in this programme;

Whereas it is necessary, as Annex II to Decision 90/221/Euratom, EEC provides, to take protection of the environment and the quality of life into account by directing research activities towards an understanding of the fundamental mechanisms of the environment and towards the devising and implementation of an overall strategy approach to risk-prevention activities, while contributing to the preparation of quality and safety standards;

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

HAS ADOPTED THIS DECISION:

Article 1

A specific research and technological development programme, for the European Community in the environment field, as defined in Annex I, is hereby adopted for a period beginning on 7 June 1991 and ending on 31 December 1994.

⁽¹⁾ OJ No C 174, 16. 7. 1990, p. 40.

⁽²⁾ OJ No C 324, 24. 12. 1990, p. 283; and OJ No C 158, 17. 6. 1991.

⁽³⁾ OJ No C 332, 31. 12. 1990, p. 23.

⁽⁴⁾ OJ No L 117, 8. 5. 1990, p. 28.

Article 2

1. The funds estimated as necessary for the execution of the programme amount to ECU 261,4 million, including expenditure on staff and administration amounting to ECU 15 million.
2. An indicative allocation of funds is set out in Annex II.
3. Should the Council take a decision in implementation of Article 1 (4) of Decision 90/221/Euratom, EEC, this Decision shall be adapted accordingly.

Article 3

Detailed rules for the implementation of the programme, including the amount of the Community's financial contribution, are set out in Annex III.

Article 4

1. In the second year of implementation of the programme, the Commission shall review it and send a report on the results of its review to the European Parliament and the Council; the report shall be accompanied, where necessary, by proposals for amendment of the programme.
2. At the end of the programme, an evaluation of the results achieved shall be conducted for the Commission by a group of independent experts. This group's report, together with any comments by the Commission, shall be submitted to the European Parliament and the Council.
3. The reports referred to in paragraphs 1 and 2 shall be established having regard to the objectives set out in Annex I to this Decision and in accordance with Article 2 (4) of Decision 90/221/Euratom, EEC.

Article 5

1. The Commission shall be responsible for the implementation of the programme.
2. Contracts concluded by the Commission shall govern the rights and obligations of each party, in particular the arrangements for the dissemination, protection and exploitation of research results, in accordance with the provisions adopted pursuant to the second subparagraph of Article 130k of the Treaty.
3. A work programme shall be drawn up in accordance with the aims set out in Annex I and updated where necessary. It shall set out the detailed objectives and types of projects to be undertaken, and the financial arrangements to be made for them. The Commission shall make calls for proposals for projects on the basis of the work programme.

Article 6

1. The Commission shall be assisted by a committee composed of representatives of the Member States and chaired by the representative of the Commission.

2. The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion within a time limit which the chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority provided for in Article 148 (2) of the Treaty as regards adoption of decisions which the Council is required to adopt on a proposal from the Commission. When the committee votes, the votes of the representatives of the Member States shall be weighted as laid down in the abovementioned Article. The chairman shall not vote.

3. The Commission shall adopt the proposed measures when they are in accordance with the committee's opinion.

4. When the proposed measures are not in accordance with the committee's opinion, or where no opinion is delivered, the Commission shall submit to the Council without delay a proposal concerning the measures to be taken. The Council shall act by a qualified majority.

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

Article 7

1. The procedure laid down in Article 6 shall apply to:

- the preparation and updating of the work programme referred to in Article 5 (3),
- the contents of the calls for proposals,
- the assessment of the projects provided for in Annex III and the estimated amount of the Community's contribution to them where this amount exceeds ECU 0,3 million,
- departures from the general rules set out in Annex III,
- the participation in any project by non-Community organizations and enterprises referred to in Article 8 (1) and (2),
- any adaptation of the indicative allocation of the amount set out in Annex II,
- the measures to be undertaken to evaluate the programme,
- arrangements for the dissemination, protection and exploitation of the results of research carried out under the programmes.

2. Where, pursuant to the third indent of paragraph one, the amount of the Community contribution is less than or equal to ECU 0,3 million, the Commission shall inform the committee of the projects and of the outcome of their assessment.

The Commission shall also inform the committee of the implementation of accompanying measures and of the concerted actions referred to in Annex III.

Article 8

1. The Commission is authorized to negotiate, in accordance with Article 130n of the Treaty, international agreements with third countries which are members of COST, particularly the member countries of EFTA and the countries of Central and Eastern Europe, with a view to associating them with the whole programme or a part of it.

2. Bodies and enterprises established in European third countries may, on the basis of the criterion of mutual benefit, be allowed to take part in action undertaken in the context of this programme. For projects in Area 1 of Annex I, this option may be extended to bodies and enterprises from other third countries engaged in research in this area.

No contracting body based outside the Community and participating as a partner in a project undertaken under the programme may benefit from Community financing for this programme. The body concerned shall contribute to the general administrative costs.

Article 9

This Decision is addressed to the Member States.

Done at Luxembourg, 7 June 1991.

For the Council
The President
R. STEICHEN

ANNEX I

SCIENTIFIC AND TECHNICAL OBJECTIVES AND CONTENT OF THE PROGRAMME

This specific programme fully reflects the approach embodied in the third framework programme in terms of the scientific and technical goals and the underlying aims which it pursues.

Paragraphs 3.A, 3.B, 3.D and 3.E of Annex II to the framework programme form an integral part of the present specific programme.

The actions envisaged will enable large projects to be undertaken to complement and strengthen the activities of the ongoing environment research programmes, the main aim being to take account of the environment and the quality of life by directing research activities towards an understanding of the fundamental mechanisms of the environment and towards devising and implementing integrated prevention strategies in all areas of human activity, and in particular to respond rapidly to the scientific challenges which arise from global change and to provide continuity in scientific support for the environmental policy of the Community.

In addition, the Community must be able to call on multidisciplinary research, able to study all the elements which make up the biosphere and follow its historical development. Such research must look both at the relationship between man and his natural environment and at his relationship with his economic, social and cultural environment etc., since these form an indivisible whole.

The following presents an analytical description of the content of the programme, based on, and taking account of, the above elements.

AREA 1: PARTICIPATION IN GLOBAL CHANGE PROGRAMMES

The goal is to contribute to understanding the processes governing environmental change and to assess the impact of human activities. Particular importance will be placed on the use of physical and chemical indicators as well as biological indicators; the latter have the advantage of providing an integrated response to all factors of change. Community participation will be concentrated on problems which will have an impact on environment policy and in areas where the Community is best placed to ensure European coordination in the framework of large international programmes while taking account of national programmes.

Natural climatic change

The objective is to reconstruct and model the evolution of the climate system of the past in order to understand better how the system may evolve under the influence of factors of human origin. Alongside other paleoclimatic data, taking advantage of deep ice core samples to be taken in the next years, research will aim at the reconstruction and modelling of the quaternary climatic cycles. In particular, the last climatic cycle should be accurately reconstructed, in order to understand and model the onset of the most recent glaciation.

Anthropogenic climate change

Research will be carried out to understand, describe and forecast climatic change resulting from the enhanced greenhouse effect due to human activities, in order to provide the scientific basis for preventive or adaptive measures. The programme will encompass the development, testing and intercomparison of integrated high-resolution global change models coupling the atmosphere (including clouds), the ocean, the biosphere and the cryosphere — especially ocean-atmosphere exchange — taking advantage of modern supercomputer and computer-linking techniques.

Climate change impacts

The aim is to forecast the physical and human impacts of the foreseen climate change in the European Community. The emphasis will be on the quantitative assessment and modelling of the impacts of the foreseen climate change, especially the sea level rise and its consequences for European towns and low-lying coastal areas, and the impacts on European agriculture, forests, water resources and other sectors of the European economy (tourism, land use, energy, transport, etc.).

Stratospheric ozone

Work will aim at understanding and forecasting processes which lead to the depletion of stratospheric ozone and the consequences of this depletion and the provision of the scientific basis for preventive measures.

New activities will include Arctic campaigns in 1991/92 and 1992/93 to identify possible ozone depletion. In parallel, data collection from a network of ground measurement stations will be coordinated, complemented by measurements from mobile stations and by laboratory research on pertinent chemical reactions. These activities will be accompanied by the modelling of stratospheric processes, including the consequences of emission scenarios, and by the assessment of the ecological and health effects of increased UV-B radiation

Tropospheric physics and chemistry

Research will be carried out to elucidate important physico-chemical processes in the troposphere as a basis for the definition of preventive measures aimed at reducing emissions. New approaches to the understanding of tropospheric ozone, radical hydroxyl, total active nitrogen oxides, hydrocarbons (solid and gaseous phase) will include coordinated clean-air measurement campaigns as well as modelling work combining meteorological and chemical models. These activities will be extended to natural emissions, in particular terpenes and other hydrocarbons and sulphur and halogen-containing compounds.

Biogeochemical cycles

Work will aim at deepening the understanding of biogeochemical cycles and their disturbance by human activities and providing the scientific basis for preventive and remedial actions.

The material balance for chemical elements will be established in a network of inland catchment areas. The study of the sources and pathways of natural and anthropogenic compounds in the European estuarine/coastal environment will be extended from the Mediterranean to other coastal areas. Emphasis will be given to regional projects of global importance, where appropriate in close cooperation with the marine sciences and technologies programme.

Ecosystem dynamics

The aim is to understand and forecast the interaction of global change and the dynamics of terrestrial and freshwater ecosystems and to provide a scientific basis for preventive and adaptive policies. The new element is the holistic approach to the investigation of important types of ecosystems such as wetlands, seminatural and agro-ecosystems. The global impact of exploitation and clearing of tropical forests and grassland and, in general, the evolution of biological and genetic diversity will receive particular attention, in close coordination with the biotechnology programme.

AREA 2: TECHNOLOGIES AND ENGINEERING FOR THE ENVIRONMENT

The objective is to promote better environment quality standards by encouraging technological innovation at the pre-competitive level. The two main lines of research in this field will be environmental monitoring, including remote sensing applications; the development of clean technologies and the development of techniques, systems and management methods to protect and rehabilitate the environment. Scientific support for the activities of the future European Environment Agency will be an important consideration in this research area.

Assessment of environmental quality and monitoring

Research will contribute to the development of advanced equipment and analytical methods for high performance environmental monitoring systems. Research will aim at the development of both airborne and ground-based methods and instruments for measuring atmospheric constituents and the design of advanced methods, including those using biological parameters, for the assessment of environmental quality. The analysis of polluting emissions (including noise), of waste, of water and of liquid effluents, with particular reference to the behaviour of pollutants on the subsoil and ground water, will receive particular attention. The development and testing of monitoring and alert systems for natural hazards such as seismic and volcanic phenomena, landslides, storms and floods, and forest fires will also be covered.

Technologies for protecting and rehabilitating the environment

Work will be carried out to contribute to the development of technologies for protecting and rehabilitating the environment including all the main aspects of urban and rural environment. Research concerned with the

treatment and chemical, physical, biological and microbiological disposal of toxic waste and of liquid effluents and the recycling of urban, agricultural and industrial wastes will be complemented by the development of low-emission and low-waste technologies for selected industrial sectors.

Research aiming at the prevention of major industrial and transport accidents through a greater understanding of hazard phenomena will be widened to include the validation of methodologies of assessing risk and will take particular account of social factors: it will also cover the development of low risk alternative technologies and sophisticated process control and detection systems.

For monuments and objects which are components of the European cultural heritage, research will quantify the causes and mechanisms of deterioration linked to natural and environmental factors, including by historical dating; new methods of condition assessment will be developed, and the scientific basis for treatments and materials for conservation will be strengthened. Activities in this area will be coordinated with the Eureka project Euro-environment and research teams funded by the programme will participate in the Eureka project Eurocare.

AREA 3: RESEARCH ON ECONOMIC AND SOCIAL ASPECTS OF ENVIRONMENTAL ISSUES

The general objective is to improve the understanding of the legal, economic, social, ethical and health aspects of environmental policy and management. Research will address critical areas of environmental social science and environmental economics research, ranging from basic development of methods and concepts and their application to environmental issues, to their incorporation into specific Community sectoral policies and environmental research programmes.

Socio-economic assessment of the changing environment

The objective is to develop the concepts of environmental social science and environmental economics and their application to environmental change and to the principles of lasting development. Account will be taken of the rapidly increasing scientific understanding of the human and natural environment. Particular attention will be given to the integration of research and development efforts in Member States and to the establishment of cooperative links with relevant international programmes.

Topics to be covered include: incorporating environmental parameters into economic methodology; cost/risk/benefit analysis; environmental indicators; risk perception; environmental ethic; early warning of environmental change including demographic, population and technological change.

Socio-economic impact of environmental policies and research

The objective is to incorporate environmental socio-economic factors into Community policies and to provide a socio-economic dimension for Community environmental research and development. Work within this theme is intended to ensure that, in line with the provisions of the Single Act, environmental factors are sufficiently taken into account in Community sectoral policies and supporting research and development.

Furthermore, as scientific and socio-economic parameters are closely interdependent in a number of research topics in the present programme, work under this theme will ensure that socio-economic considerations and parameters are properly incorporated into relevant coordinated research projects. Illustrative examples include: integrated waste recycling systems within the internal market; ecological consequences of demographic and population changes (e.g. Alps and other mountain regions); environmental impact of tourism.

AREA 4: TECHNOLOGICAL AND NATURAL RISKS

The objective is to help solve broad problems of transnational interest through a system approach and interdisciplinary research.

Projects will relate to the following fields:

Natural risks

Work will aim at understanding the causes, mechanisms and consequences of hazardous environmental phenomena, and providing the scientific basis for disaster management (preparedness, prediction, alert, mitigation or prevention, recovery and redevelopment).

Integrated research in this area will provide a European contribution to the 'International Decade for Natural Hazard Reduction'. It will cover telluric, meteorological and hydrogeological hazards, including research on forest fires, floods and slope instability and the phenomenology of extreme hazardous meteorological events.

Research on telluric hazards (earthquakes and volcanic eruptions) will consist mainly of theoretical studies of telluric phenomena and of the behaviour of structures during these phenomena and will aim at the setting up of field measurement sites and of rapid intervention networks in selected active zones in the Community.

Technological risks

The aim is to understand the consequences of human activities, technologies and products for human health and the environment as a basis for preventive Community policies and legislation.

Research in this area will cover the development and validation of systems for testing and assessment of chemicals for health and ecological effects. It will be complemented by studies of the effect of environmental pollution and electro-magnetic emissions on human health. Furthermore, the risks from agricultural technologies and land-use practices to soil and groundwater quality will be investigated. This work will extend to regional aspects of ecosystem protection including the eutrophication of coastal seas (in liaison with the specific programme on marine science and technology), the protection and conservation of habitats, forest dieback and the acidification of water bodies.

Desertification in the Mediterranean area

Research will be carried out to assess the natural and human causes, the mechanisms and the impact of the spread of desertification in the Mediterranean area. Research will deal with the history, causes (human and climatic) and consequences of desertification. Strategies to combat desertification will be developed and their application to selected test zones will be envisaged.

ANNEX II

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

<i>(in million ecus)</i>	
Area	Breakdown
1. Participation in global changes programmes	104,6
2. Technologies and engineering for the environment	65,3
3. Research on economic and social aspects of environmental issues	15,7
4. Technological and natural risks	75,8
	Total 261,4 ⁽¹⁾ ⁽²⁾

(1) Including expenditure on staff which comes to ECU 10,4 million and administrative expenditure totalling ECU 4,6 million. At least 10 % of the total will be allocated to basic research and 2 % to training.

(2) An additional ECU 150 million will be earmarked for JRC research activities on the environment, including ECU 1,5 million representing the JRC's contribution to centralized dissemination activities under the present specific programme. A sum of ECU 2,6 million, not included in the ECU 261,4 million, will be earmarked as the contribution from the specific environment programme to the centralized scheme for the dissemination and exploitation of results.

The breakdown between different headings does not exclude the possibility that projects could come under several headings.

ANNEX III

RULES FOR IMPLEMENTING THE PROGRAMME

1. The Commission will implement the programme on the basis of the scientific and technical content described in Annex I.
2. The rules for implementing the programme, referred to in Article 3, comprise research and technological development projects, accompanying measures and concerted actions:

— Research projects

The projects will be the subject of shared-cost research and technological development contracts. Selection of projects must take account of the criteria listed in Annex III to Decision 90/221/Euratom, EEC and of the objectives set out in Annex I to this programme.

For shared-cost projects Community financial participation will not normally be more than 50%. Universities and other research centres participating in shared-cost projects will have the option of requesting, for each project, either 50 % funding of total expenditure or 100 % funding of the additional marginal costs.

Shared-cost research projects must, as a general rule, be carried out by participants established within the Community. Projects in which for example universities, research organizations and industrial firms, including small and medium-sized undertakings, may participate must, as a general rule, provide for the participation of at least two partners, the one being independent of the other and established in a different Member State. Contracts relating to shared-cost research projects must as a general rule be concluded following a selection procedure based on calls for tenders published in the *Official Journal of the European Communities*.

The Commission will publish a vade-mecum setting out all the rules applying to the selection of projects, in order to guarantee full transparency.

— Accompanying measures

The accompanying measures referred to in Article 7 will consist of:

- the organization of seminars, workshops and scientific conferences,
- internal coordination through the creation of integrating groups,
- advanced technology training programmes, with emphasis being placed on multidisciplinarity,
- promotion of the exploitation of results,
- ongoing consideration of the problems arising in the long term in the environmental sphere, by a high-level working party of experts,
- independent scientific and strategic evaluation of the operation of the projects and the programme.

— Concerted actions

Concerted actions consist of action by the Community to coordinate the individual research activities carried out in the Member States. They may benefit from funding of up to 100 % of coordinating expenditure.

3. The knowledge acquired in the course of the projects will be disseminated both within the specific programme and by means of a centralized activity, pursuant to the Decision referred to in the third subparagraph of Article 4 of Decision 90/221/Euratom, EEC.
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