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COMMUNICATION FROM THE COMMISSION

RESEARCH AND TECHNOLOGICAL DEVELOPMENT

ACHIEVING COORDINATION THROUGH COOPERATION

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1. INTRODUCTION

Articles 130 I and 130 H of the Treaty, establishing the European Community, provide for two complementary basic instruments for research and technological development: the *Framework Programme* setting out all the Community's RTD activities and *coordination of national and European RTD policies.* While the encouraging experience built up over the last ten years has firmly established the concept of the Framework Programmes, the second instrument has remained largely a dead letter despite the recent initiatives by the Danish, Italian and Dutch presidencies. This situation should change now, however, since one of the six policy priorities recently adopted by the European Council in Corfu called on the Council to seek more systematic coordination of Community and national research policies and on the Commission to take any appropriate initiative to promote such coordination. This concern is also shared by the European Parliament, which adopted a resolution on the subject in May 1994. More recently, at the instigation of the German presidency, coordination of RTD policies was the main issue discussed at the informal Council meeting on research in Schwerin, where the ministers reached a consensus that talks on this subject must continue.

In response to today's challenges and to the weaknesses of the Community highlighted in the White Paper (the underinvestment in RTD in the Union, compared with the USA and Japan, the fragmentation of the Member States' RTD policies, the imbalance between competitiveness inside and outside the Union and the Union's shortcomings in transferring and applying research results, compared with its leading rivals), the time has come to implement the Treaty on European Union in its entirety, i.e. to add a new dimension to the Community's RTD activities by taking coordination measures to make the national and Community policies more consistent and, thereby, make all the still overfragmented efforts more efficient.

In this connection, a distinction must be drawn between two concepts:
-*cooperation*, which is now accepted by everyone as the usual mechanism for Community action, with the obvious advantages of voluntary pooling of efforts and skills on a case-by-case basis;
-*coordination*, a mechanism which promises major advantages for increasing the e[illegible] of all RTD activities but which also imposes greater constraints and, hence, is h[illegible] accept.
For this reason, the Commission proposes a progressive approach to achieve [illegible] coordination by intensifying cooperation at the various stages of drafting [illegible] implementing RTD policy.

2. CURRENT SITUATION

The efforts made directly under the Framework Programme account for approximately 4% [illegible] public spending on RTD in the Union (cf. Annex A1). The total resources mobilized [illegible] effect") via the Framework Programme are equivalent to roughly 6% of public RTD r[illegible] as approximately half of the national share of the funding is contributed by the priva[illegible] The Member States allocate another 7% or so of their public RTD funding to joint [illegible] European ventures such as the ESA, CERN, EUREKA, etc. (cf. Annex 2 for a table and fac sheets on the various endeavours).
Consequently, approximately 13% of public RTD resources are allocated to E[illegible] cooperation, while the rest are decided and managed autonomously by the Memb[illegible] (cf. Annex A3 for fact sheets on the Member States). However, the trend to freeze or [illegible]

public RTD budgets in most Member States since the early '90s has created a need to improve the efficiency of the action taken by the public authorities in Europe in response to the increasingly important challenges facing them all (industrial competitiveness, employment, environment policies, participation in large-scale projects, etc.). Closer cooperation and coordination leading to more consistent use of all these resources should mitigate the adverse effects of this fragmentation and, at the same time, ensure that the action has a greater impact and is more effective.

3. PROPOSED APPROACH

First, it must be recognized that coordination of national policies cannot be laid down by law. It can only come about through **common assent** and must become a habit, a state of mind driven by an awareness of its obvious benefits.

This coordination must **benefit not only the participants but also the Community as a whole.** Any financial contribution from the Community to activities in this area must depend directly on the benefits accruing to the Community as a whole.

The approach taken must be multifaceted and flexible, but also practical. Different types of activity will be undertaken at different levels:

- on **determination of RTD policies,** with the objective of providing ministers in the Union with a forum for discussion with systematic preparatory work to supply the information which they all need;

- on **implementation of research activities,** including not only those covered by the Framework Programme for implementing Articles 130 K and 130 L but also the activities under the national programmes in order to make all the efforts more consistent;

- on **international cooperation,** where a stronger presence on the part of the European Union is both desirable and attainable, without impinging on the Member States' prerogatives.

Completion of the trans-European communications networks will make a major contribution to attaining such coordination by improving contacts between laboratories, the authorities and all involved in RTD in Europe.

3.1. DETERMINATION OF RTD POLICIES

One thing is clear: Member States decide Community policy together but determine their own national policies. Of course, there is some interaction between the decisions taken at these two levels: although the general guidelines for the Framework Programmes are directed towards action by the Community, they are based on what is known about the national priorities and have a definite impact on national perceptions and analyses of the situation. This impact in turn depends on tradition and the level of research attained in the individual Member States. However, a pro-active approach must be taken to achieve more than the limited benefits yielded by this interaction. The following measures in particular could be envisaged:

(a) **In order to provide a basis of sound, comparable information on national RTD policies,** it will be necessary to extend the collection of harmonised statistical and the comparison of national policies to the EEA countries and a transversal a must be adopted allowing comparative case studies on specific themes (for example, indirect support for research, the mobility and situation of researchers, large facilities, the development of European database networks, etc.) or on issues of interest (for example, aid code for research, Community partnerships, etc.).

(b) **In order to provide a common basis for analysis and forecasting and to fo scenarios for consideration by decision-makers at Member State and Com level,** from 1995 onwards the Union will deploy its observation, forecasting, and discussion capacity in the "evaluation of scientific and technological policy section of the "targeted socio-economic research" programme. The E Technology Assessment Network (ETAN) will participate in this work and,

facilitate cooperation between the specialist organizations and units in the Member States and the expertise of JRC's European Science and Technology Observatory in Seville, EUROSTAT and other Commisison Services. The **European Report on S&T indicators** could gradually become a reference work fuelling the debate.

(c) **In order to encourage exchanges of information and analyses across the Union, to start concertation and to promote interregional cooperation on common problems,** meetings could be held between the national research bodies and between European scientific cooperation organizations and bodies, together with transfrontier regional conferences. These meetings or conferences could focus on the transversal topics mentioned in paragraph (a) in particular.

(d) **In order to support closer political cooperation and coordination,** the information and scenarios established in this way could first be examined by **the heads of the departments responsible for formulating national research policy** (a reformed CREST Committee). These meetings could be followed by **regular meetings at ministerial level** (such as the meeting at Schwerin in July 1994), at which ministers could compare approaches and evolve more consistent general guidelines and policies. . The discussions at each meeting should focus on a limited number of problems facing ministers and, of course, take account of the problems and choices within other more specialized cooperation bodies, such as the ESA, CERN, EMBL, etc.

(e) **In order to fulfil its obligation to act as an initiator, the Commission** will play an active part in these meetings and, in particular, propose draft **Council Resolutions** .

3.2. IMPLEMENTATION OF RESEARCH ACTIVITIES

The mere fact of acting at Community level implies, in practice, a degree of convergence between national and Community RTD activities. This is seen, in particular, during the establishment and implementation of the various specific programmes. The question is how to go beyond such "*de facto*" coordination.

3.2.1 Activities under the Community's specific programmes

(a) The **committees for each programme** already ensure a degree of coordination between Community and national programmes. However, they should carry out **more systematic exchanges of information on the relevant national activities** with a view to **closer identification of the areas where greater cooperation and coordination** could be beneficial. This should of course be applied to the four actions of the Framework Programme including those concerning the dissemination and exploitation of results, innovation in SMEs and technology transfer as covered by the 3rd action.

(b) In its proposal for the fourth Framework Programme, the Commission recommended that **the project selection procedure should give particular priority to action likely to enhance cooperation or coordination** between the Member States. Although certainly important, this is not enough to respond to some of industry's needs . The generic approach taken in the Community programmes means that these activities sometimes cut across several different specific programmes and necessitate **vertical coordination between programmes.** Beyond conventional solutions such as more consistent work programmes, simultaneous publication of the corresponding calls for proposals and joint evaluation of the subsequent replies, **fresh flexibility must be introduced to soften the rigid barriers between programmes .** (For examples see Annexes 1 for aeronautics, 2 for automobile and 3 for maritime RTD activities. Industry in these sectors are cooperating at the European level to establish common research programmes). The role played by the **committees on the relevant programmes** and the **internal coordination** which each Member States must ensure between its representatives on each of these committees will determine the success of any inter-programme activities.

(c) At the programme implementation stage, in order to define a **consistent framework for action** in a specific area, talks with industry including SMEs must be stepped up by **meetings on selected topics**, with particular emphasis on **contacts between "users" and "producers"**, but also with the relevant research centres and universities.

(d) **Efforts must be made to improve operational cooperation with other European RTD organizations or agencies.** Annexes 4, 5, 6 and 7 give examples of the measures which could be envisaged with the European Space Agency, Eureka, EMBL and the CERN.

3.2.2 One path to explore: application of Articles 130 K and 130 L[1]

In the context of the implementation of theFrameworkProgrammes, Articles 130 K and 130 L of the Treaty provide tools to ensure closer cooperation of benefit to the Community as a whole. However, neither **complementary** programmes involving the participation of certain Member States nor **Community participation** in programmes undertaken by several Member States have yet been put into practice (outside the Euratom Treaty), in spite of the fact that these possibilities, foreseen in the Fourth Framework Programme, could provide a way for the Community to respond to new initiatives or to participate in existing programmes involving only a few Member States.

In particular, these provisions offer **advantages** such as gathering together technologies emerging from the various RTD programmes around an objective of interest to the entire Community, achieving a sufficient critical mass by combining national and Community funds and, hence, making all RTD efforts in the European Union more efficient.

There are **many difficulties** in using these tools, but these can be overcome if they are studied seriously in the spirit of the conclusions reached in Corfu. Particular consideration should be given to:

- the definition of the benefits which the activities planned can bring to the Community, which is one precondition for Community funding;
- the benefits of submission of packages of activities in order to meet the needs of all the Member States;
- the practicalities of the diffusion of know-how and non-participating Member States access;
- the determination of the amount of funding to be allocated to these activities.

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[1](reference to annex 8)

The decisive **criteria** for determining the benefit of such schemes to the Community could be based on: **European public interest** where the cooperation would allow a fuller contribution to implementing the common policies on, for example, the environment, networks or health; **joint public-sector/private-sector interest** where the cooperation would help to attain the objectives of the public sector in Europe and to make industry more competitive (for example, air traffic safety or clean technologies); and **the benefits for European industry** in terms of those activities needed to keep them competitive (for example, components for electric cars, aircraft engines, etc.). Particular attention must be paid to training and to dissemination and application of the results by every Member State.

Since each of the activities planned will probably concern only a limited number of Member States, **a balanced package of proposals** must be submitted to ensure the broadest possible participation by all the Member States. The accent should be placed on sufficiently broad objectives such as "key" components rather than on over-general, costly sectoral objectives (for example, "lightweight batteries" rather than "the clean car").

But it must also be possible to fund these activities. Today specific programmes swallow up all the financial resources available for the Fourth Framework Programme. This implies that Articles 130 K and 130 L can be implemented only from within the specific programmes and, consequently, makes it complicated and difficult to support initiatives cutting across several programmes. Alongside the conventional first activity in the Framework Programme consideration could also be given to **specifying and reserving from the start, when adopting the framework programme, a set amount for the establishment and funding of the complementary programmes and Community participation.**

If there is the political will to explore **this new approach**, then this thinking should first lead to a limited number of **pilot** actions, based on the experience acquired through the inter-programme cooperation **within** the Fourth Framework Programme, and using the provision made for additional funding when the programme comes up for review in 1996. This should subsequently lead to the **introduction of a new approach in the Fifth Framework Programme.**

3.2.3 Activities under the national programmes

Given the degree of integration in Europe, particularly with the completion of the internal market, **Member States should encourage research teams from other Member States to participate in their own programmes in order to promote the establishment of partnerships and RTD networks in the European Union.** This will be possible only on a genuinely reciprocal basis progressing gradually, for example, from areas of interest to the entire Community.

3.3. INTERNATIONAL COOPERATION

The Union must speak with a single voice on international bodies and in order to participate in worldwide programmes. This is the only way that the Union will be able to exert an influence over its partners in these organizations that is commensurate with its size. Suffice to say that from 1995 onwards the Union will probably represent 16 of the 25 members of the OECD! Consequently, arrangements should be made for **systematic Community concertation before all meetings of such international bodies.** Large-scale projects, the worldwide programmes on genome sequencing or on climate change and standardization are all practical examples. In any event, the experience gained with the ITER in the field of controlled thermonuclear fusion demonstrates that this approach is both possible and advantageous.

It would be useful in bilateral negotiations between the european Union and third parties, especially is instances where the Member States endorse (or ratify) RTD and international political cooperation agreements, to maintain a regular exchange of information between the Commission and Member States. This exchange could cover the areas concerned, the practicalities of implementation and the prospects of common actions with other Member States (for exemple see paragraph 3.2.3.).

Particular attention must be paid to the areas of intellectual property rights which were the subject of an agreement between the Council and the Commission on 26 June 1993.

4. THE ROLE OF CREST AND OF THE EUROPEAN SCIENCE AND TECHNOLOGY ASSEMBLY IN THIS CONTEXT

The approach proposed will not be feasible without the voluntary participation and full collaboration of the national RTD policymakers. In practice, the tasks mentioned above correspond closely to the remit assigned to CREST by the 1974 Resolution. **Steps must be taken to ensure that CREST effectively completes its original mandate and spends its time on working at the appropriate level on this essential task of achieving coordination through cooperation and ensures the follow-up.** To this end, CREST should redirect work and give this task priority over the activities on the specific programmes which are more direct concern to the members of the committees responsible for the topics covered each programme.

When preparing its proposals the Commission will carefully study the contributions opinions which it receives from the European Science and Technology Assembly, accordance with its mandate. In particular, the Commission attaches genuine impor the work of this assembly of eminent personalities, which brings together a pool of kn and experience unique in Europe, from various fields and organizations playing an active in RTD.

5. CONCLUSIONS

In order to implement Article 130 H, a progressive, practical approach is needed. To **coordination of RTD policies must be discussed continuously**, possibly leading in the instance to the steady adoption of Council resolutions. In the light of the foregoing, **Commission proposes that the Council debate the general lines of action proposed in communication in order to proceed with putting into practice Article 130 H.**

ANNEXES 1 TO 8

Annex 1: Coordination of RTD activities on aeronautics in the Community RTD programmes

Annex 2: Coordination of automobile RTD activities in the Community programmes

Annex 3: Coordination of maritime RTD activities in the Community programmes

Annex 4: Coordination of Community and Member State RTD activities in the space sector

Annex 5: Coordination between EUREKA and the Community RTD programmes

Annex 6: Relationship between the EC and the EMBL

Annex 7: CERN and the European Community

Annex 8: Supplementary programmes and Community participation.

Explanatory note concerning Annexes 1 to 7

In these annexes are 7 examples of collaborations in the area of RTD involving industry, organisations and frameworks of international cooperation.

- In the case of annexes 1, 2 and 3, it is a question of collaborations established between Commisison Services and representatons of industry at the European level in order to : define efficient mechanisms for the optimal use of the possibilities offered by the horizontal specific programmes; and offer solutions, based on a coordinated plan of actions, to vertical problems.

- The mixed groups have a transitory character being limited to the definition phase of work programmes. Responsibility for implementation does reside solely with the Commission to the exclusion of any form of programme co-management; this does not rule out, however, keeping industry regularly informed in order to ensure that improvement can be made to the implementation of the work prepared.

- Annexes 4 to 7 comprise explanatory notes from the Commission Services on the forms of on-going or planned collaboration with organisations and international cooperation programmes in the area of RTD as mentioned explicitely in the Framework Programme.

ANNEX 1

Coordination of RTD activities on aeronautics in the Community RTD programmes

For the purposes of this document, this field includes research into the air transport system, air traffic management and aeronautical technologies.

1. Current situation

1.1 The main specific programmes including RTD activities in the field of aeronautics are:

- Industrial and materials technologies: Area 3 - Technologies for means of transport
- Telematics applications of common interest - Air transport
- Transport - Air traffic management and air transport safety
- Energy - Clean and efficient energy technologies - Hydrocarbon combustion and new fuels for transport
- Environment - RTD activities in the field of environment and climate - Atmosphere physics and chemistry
- The information technologies programme and Areas 1 and 2 of the industrial technologies and materials technologies programme could also apply.

1.2 The RTD activities on one aspect of aeronautical technology - air traffic management - are already coordinated effectively. In particular, preparation of ECARDA (the European Coherent Approach for RTD in Air Traffic Management) entailed coordination between three programmes involving three different Directorates-General. Appropriate measures will be taken to continue this coordination.

1.3 The industry and the research community, particularly aeronautical research establishments, have played a major role in helping the Commission to develop the Community's aeronautical research activities. In addition to the personal involvement of many individuals this contribution has been given more consistent form by the informal recommendations made by the Aeronautical Research and Technology Committee (ARTCO), by the long-term technology plan and by the proposals concerning the ECARDA approach for air traffic management, the AEROSAFE[2] study which

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[2] AEROSAFE: Action plan for European pre-normative research on air transport safety.

identifies the priorities for the RTD on safety and APARTE[3] which examines the priorities for the environmental RTD activities in the field of aeronautics.

1.4 A broad range of players from industry and the world of research are involved in preparing the Community's future aeronautics RTD programmes and in the RTD activities already in progress. They include aircraftmakers, enginemakers and suppliers of a wide range of electronics, communications, passenger environment and landing gear equipment alongside airlines, aviation authorities and research establishments. Although the industry includes a number of big companies, these make wide use of subcontractors, including large numbers of small firms.

1.5 In this connection, the seven aeronautical research centres in Europe recently concluded an association agreement to improve coordination of their own activities and bring them closer into line with the trend in the industry towards a more European structure.

2. Aeronautics RTD must be coordinated

2.1 Various Community policies underline the importance of the air transport system. The "Industrial technologies - technologies for transport means" section of the Framework Programme states that "Special emphasis will continue to be given to aeronautics research both to ensure continuity with the activities undertaken in the Third Framework programme and to reflect further the essential advanced technology requirements of this industry and its capability for proving feasibility of advanced generic technologies which can then be spun off to other transport or industrial sectors".

2.2 This special emphasis on aeronautics reflects, *inter alia*, the predominant role which this industry plays in technology, the particularly long lead times between the start of RTD activities and the introduction of the resultant new technologies, the broad cooperation between makers on a wide range of projects, the public authorities' responsibility for the regulations on safety, on the environmental impact and on the operating infrastructure, the extremely strong competition from the USA with the backing of the US Government, the extensive national programmes and the fact that the GATT agreements treat aeronautics as a special case.

2.3 In the European context, these considerations cannot be divorced from the need to reduce congestion of airports and air space, which calls first for a harmonized and, subsequently, for a unified air traffic management system.

2.4 This combination of topics is ample reason to establish a framework for appropriate coordination of the RTD activities on aeronautics.

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[3] APARTE: Aircraft pollution abatement by research and technology for the environment.

3. Objectives of a mechanism for coordination of RTD activities on aeronautics

3.1 The principal objectives of this coordination are:

- to ensure that the RTD priorities on aeronautics in the Community's specific programmes match the needs of the industry and of the competent authorities and generate synergies with the activities of the Member States;

- to ensure overall coordination of the activities on topics such as traffic management, aeronautical technologies and the air transport system;

- to provide an interface with the specific programmes corresponding to the RTD priorities for aeronautics so that they can be taken into account when preparing the work programmes;

- to facilitate spin-offs in other industries in areas where the aviation industry is at the leading edge of technology;

- to provide a smooth interface and a means of communicating with all involved in RTD;

- to monitor and report to the Member States and decision-makers on progress with the RTD activities on aeronautics;

- to facilitate coordination between the Member States and between the Member States and the Community, including the relevant national and international activities such as EUREKA and bilateral arrangements.

In addition, this coordination would help to create a favourable environment for a competitive, socially acceptable transport system.

4. Coordination mechanism

Coordination will be achieved by means of:

4.1 Formulation of an action plan laying the foundation on which the aeronautics activities in the various specific programmes could be based. This should be prepared by the Commission and fine tuned in collaboration with all involved, including the relevant industries. It would indicate the activities to be coordinated, such as the work on aeronautical technologies, air traffic management (to follow up ECARDA) and the air transport system to reflect the need for a competitive, socially acceptable transport system.

4.2 Harmonization and synchronization, as far as possible, of preparation of the work plans, of publication of calls for proposals and of submission of additional information, evaluations, progress reports on research contracts and of dissemination and application of the results.

4.3 Establishment of an interdepartmental task force to promote coordination by organizing establishment and management of this action plan and gathering the opinions of industry and research centres with the mandate to submit regular reports on the results obtained.

4.4 An extra response by the Member States so that they can coordinate their research programmes with each other's and with the Commission's programmes, taking account of the subsidiarity principle.

4.5 After some time (for example, two years) the effectiveness of this coordination will be evaluated, based on the results obtained.

Coordination of automobile RTD activities in the Community RTD programmes

1. Problem

1.1 Increasingly, the horizontal, generic nature of research has highlighted the need to start a constant, informal dialogue with branches of industry in order to take account of their requirements when defining the specific programmes and to coordinate the research activities funded by these programmes.

1.2 In this context, the Fourth Framework Programme stresses the importance of an "operational" approach in order to establish an effective interface between cross-discipline research programmes and the needs of industrial users. To this end, it stresses the need for the Commission to coordinate the activities in the various horizontal research programmes. This applies in particular to the transport sector, especially the automobile industry.

2. Need for coordination of RTD activities in the automobile industry

2.1 The principal specific programmes containing RTD activities on the automobile industry are:

- Industrial technologies and materials technologies, particularly Area 3 (technologies for transport means)
- Transport, particularly the activities on "urban transport" and "road transport"
- Telematics applications of common interest
- Information technologies, particularly the activities on "technologies for IT components and subsystems"
- Non-nuclear energy, particularly the action on "improved conversion and use of energy".

The environment programme could also apply.

2.2 Measures have already been taken to coordinate activities in the automobile sector during the preparations for the Council Resolution of 16 May 1994 on the automobile industry.

2.3 This Resolution emphasizes that public policy in the field of R&TD must be optimized through effective coordination of Union, national and EUREKA programmes and projects. It also mentions the need for better coordination between individual research programmes in such a way as to cover themes relevant to improved competitiveness, to facilitate access to the programmes, to improve the dissemination of research results and to facilitate industry planning in this sphere.

2.4 The automobile industry defined its priority research needs in its EUCAR action
However, a broad spectrum of industries and technologies are also involved in
activities in the automobile sector. They include suppliers of components,
materials, electronics, communications and optical equipment plus more tr
sectors such as the building and civil engineering industries for infrastructure or
textiles industry for the interior upholstery of vehicles. Small and medi
businesses are heavily involved in all these sectors.

3. Objectives of coordination

3.1 The objectives of the inter-programme coordination are:

- to make the various specific programmes more complementary and
coordination with the other RTD activities or initiatives in this field, pai
within the EUREKA framework;

- to help potential participants to submit proposals under the most ap
programmes; and

- to avoid any possible overlap.

3.2 The coordination activities planned must not clash with the normal activities of
departments responsible for the programmes or with the rules and specific chara
of each programme.

4. Coordination

4.1 Simple, effective coordination arrangements are proposed in order (1) to respond to
problems at the interface between industry and the Commission departments and (2)
ensure consistent management of all research activities in sectors related to
automobile industry.

4.2 To avoid creating new structures, a temporary joint working party of Cor
officials and representatives of the relevant industries will be set up. All industrial
public users (representatives of manufacturers, suppliers and operators) and the
managing the relevant specific programmes will participate. The joint coo
group will work for only a limited period and will be convened and consulted
during the drafting and revision stages of the specific programmes and
programmes.

4.3 This working party will be instructed:

- to ensure easier access to the R&D programmes for the sectors of
concerned, by defining consistent, complementary specific work prog

- to ensure greater concentration on strategic issues and avoid any fragn
and duplication of effort;

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- to give guidelines to proposers to ensure conformity with the research objectives, the eligibility criteria and coordination with other specific programmes and European initiatives;

- to allow the introduction of more flexible management arrangements better suited to the participants' needs;

- to organize joint workshops, conferences or other meetings, with the participation of the consortia selected within the EUREKA framework.

4.4 To this end, the working party will contribute to:

(i) ensuring that the research priorities specified in the strategy formulated by the automobile industry in the EUCAR action plan can be taken into account by the relevant specific programmes and work programmes in order to guarantee that they are complementary and avoid all duplication of effort;

(ii) identifying, where appropriate, targeted research topics for which an integrated approach could be taken. These comprise topics involving various research activities contained in different specific programmes which call for integrated management in order to ensure that they make an impact on society, the environment and the market.

4.5 Identification of an extremely precise objective, as mentioned in paragraph 4.4(ii), covering targeted research activities on issues covered by several specific programmes could lead, once the various committees concerned have given their opinion, to integrated management of calls for proposals, of the selection procedure and of monitoring of the projects selected.

Coordination of maritime RTD activities in the Community RTD programmes

1. Scope and nature of the problem

Maritime Industries cover a very wide range of sea-related activities either connected to the transport chain or the exploitation of the oceans.

Maritime Industries consist of a very broad range of enterprises including large as well as SME's and they utilise a multitude of technologies and adapt R&D results from many disciplines.

Taking into the account this peculiar situation, the Maritime Industries Forum created on the initiative of the Commission (Com(91) 335 final, 20 September 1991) set up different Panels led by industry representatives and aimed at providing Commission Services particularly those responsible for R&D with adequate inputs for the preparation of the Specific Programmes and the working programmes.

In this context the importance of an effective mechanism of coordination of research activities was highlighted on several occasions and considered as one of the most important recommendations.

2. The need for coordination of R&D activities in the Maritime Industries.

Main specific programmes relevant to R& D in Maritime Industries:

- Industrial technologies and material technologies, particularly Area 3,B (technologies for surface transport means)
- Transport, particularly the activities on "integrated transport chains" and "waterborne transport"
- Telematics applications of common interest
- Information technologies
- Marine resources in the "marine science and technology" Programme
- Fishing and aquaculture under the Programme on "agriculture and fisheries"
- Offshore hydrocarbons and renewable energies under the Programme on "Technologies for cleaner and more efficient energy production and use".

Industry presented their priority areas in different documents discussed in the Panels for

- Short sea shipping
- Marine Resources
- E.D.I

and in a specific workshop on R&D for Waterborne Transport.

3. Objectives of Coordination

- to promote synergies between different programmes and avoid overlapping
- to give a clear guidance to economic operators when making proposals

4. Coordination Mechanism

A pragmatic and non-bureaucratic approach should be at the basis of a coordination mechanism that would ensure an adequate consultation of industry and an effective consistency between R&D programmes relevant to maritime industries.
This consultation by Commission services would be carried out based on experience gained through MIF (Maritime Industries Forum) panels.

Coordination of Community and Member State RTD activities in the space sector

1. The Commission's partners in the space industry

Some Member States have set up special agencies whose main purpose is to implement the national space programmes. This is the case in France, which was the first country in Europe to develop its own space programme and which set up the Centre National d'Etudes Spatiales (CNES). Germany, too, has set up an Agency (DARA) to plan and implement the German space programme. In Italy the ASI coordinates and implements all the national and international space programmes. Britain was somewhat slower in setting up the British National Space Centre (BNSC), while the other European countries channel most of their space activities through the European Space Agency, with the exception of Belgium, the Netherlands and Sweden, all of which have sizeable national programmes. All these programmes are concerned primarily with the development of the space segment.

The European Space Agency (ESA) was set up to provide for and promote cooperation between European countries on space RTD and applications, both for scientific purposes and to produce space applications systems. To this end, the ESA frames and implements a long-term European space policy, recommends space objectives to its Member States and coordinates their policies with regard to other national and international organizations and institutions. It devises and implements activities and programmes, notably on the development of applications satellites.

2. Relations between the Commission and its partners in the space industry

2.1 With the Member States

The Commission has established more or less organized working relations with the space agencies and relevant ministries in the Member States. It has signed an agreement with the CNES on the production of an instrument (VEGETATION) to be loaded onto SPOT-4. One function of this instrument, which is considered a pilot project, will be to provide information for use in implementing the common agricultural policy. The ASI and the relevant agencies from Belgium and Sweden (SNSB) are also involved in the project. With DARA the Commission is studying another demonstration project to measure the chemical composition of the atmosphere (AMAS). Other scientific and technical work is being carried out with close collaboration between the JRC's Institute for Remote Sensing Applications (IRSA) and the national bodies responsible for implementing the Member States' space policies, particularly the CNES.

2.2 With the ESA

Relations with the Agency are of relatively long standing and are well structured. The two institutions have reached many agreements on specific subjects since 1980 and contacts have been stepped up. Meetings have taken place between the Director-General of the Agency and members of the Commission to determine the content and methods of cooperation between the two institutions.

There are currently six joint working parties on Earth observation, telecommunications, industrial policy, international relations, RTD and education/training. There are promising new areas of cooperation such as satellite navigation, a theme providing the basis to a recently adopted Commission communication (COM(94)248 of 14 June 1994) for which the implementation requires a re-inforced coordination with the ESA. and the promotion of remote sensing in the developing countries. Coordination on the issue of commercial launch services is a good example of the constructive relationship between the two institutions.

Following the meeting between the Director-General of the Agency and the Commission member responsible for science, research and development and education, a draft agreement was drawn up to step up, broaden and facilitate cooperation between the two institutions within the limits of their respective competence with a view to contributing to the smooth development of a European policy on space, with particular regard to the application of space technology. This agreement has still to be finalized through the appropriate procedures.

2.3 The *ad hoc* space advisory group (SAG)

As indicated in communication COM(92)360 final, and in the light of the Council's conclusions on the communication, the Commission set up an *ad hoc* space advisory group in 1993. The group is made up of representatives of the Member States and advises the Commission on the complementarity and synergy of its activities with those of the Member States and the ESA with a view to making Europe's efforts to exploit space technology more effective.

3. The role of the Commission

The Commission's role with regard to space was set out in communication COM(92) 360 final, which the Council approved in April 1993. The Council agreed on the need for enhanced synergy and complementarity between the Community RTD programmes and the activities of the European Space Agency (ESA) and, with due regard to the provisions of the Treaty, between the activities of the Member States and those of international organizations. At the same time, duplication of effort should be avoided and the operating rules and procedures of the Community and the ESA should be fully observed.

The Commission's role within this framework is essentially that of promoter and user of space technology, notably in the field of Earth observation, and its aim is to help optimize the use of satellite data and to implement Community policies. The Commission also seeks to create conditions which will encourage expansion of the markets for applications of space technology and help Europe's space industry become more competitive.

4. Proposals

The following initiatives could be taken to ensure closer coordination of national and European RTD policies in the space sector:

- set up joint working parties between the Commission and the national space agencies, such as already exists with the ESA (discussions are being held with the CNES to this end);

- use the SAG and the abovementioned working parties:

  (a) to compare and examine the Member States' policies in this area in order to identify, analyse and compare the objectives of the Member States so as to produce common objectives (coordination of RTD policy-making);

  (b) to define activities of common interest (coordination of programme implementation);

  (c) to seek a concerted or coordinated attitude among the Member States at international level (coordination of international cooperation).

ANNEX 5

Coordination between EUREKA and the Community RTD programmes

Introduction

The specific programmes implementing the Fourth Framework Programme provide for participation in certain activities within the EUREKA framework (Article 5). However, the measures taken to improve the links between Community research, technological development and demonstration (RTD) activities and EUREKA should build on the respective strengths of each. They should not be allowed adversely to affect the operation or to reduce the impact of either. Similarly, other mechanisms for the stimulation of RTD in Europe may also need to be involved.

One of the main reasons for improving synergy between EUREKA and Community programmes is to encourage the take-up of the results of Community projects in a framework closer to the market and, ultimately, to encourage the emergence of new European products and services competitive on world markets. Similarly, EUREKA projects are encouraged to participate in Community RTD programmes, which in general concentrate on generic, precompetitive research of multisectoral application, and to submit proposals for work to complement their own activities, in response to Community calls for proposals, where appropriate.

As the specific programmes implementing the Fourth FrameworkProgramme are approved and brought into operation, the Commission will examine in more detail how closer coordination with EUREKA could improve information and assistance, project coordination, standardization and associated activities.

In addition, from its discussions with all concerned, including industry, the Commission is identifying a coherent framework for specific activities. In conjunction with national policies and the activities carried out under EUREKA, this might help identify areas of particular interest to customers and providers of RTD and highlight their future priorities.

Information and assistance

There is already close cooperation on the dissemination of information and on organizing information events, but this could be improved and extended. It includes the early exchange of information about future activities, the joint organization of promotional events, "brokerage" meetings and other activities to assist in the exchange of ideas, identification of partners, preparation of proposals, etc. and measures to encourage the transfer and take-up of project results.

The Commission is currently looking at the national systems for disseminating information on Community RTD programmes and, in conjunction with Member States, will examine how these might be improved. It would be useful if coordination allowed information and assistance networks to deal effectively with enquiries about EUREKA and EC RTD, offering a sort of "one-stop shop" for European R&D and demonstration activities.

EUREKA National Project Coordinators are automatically supplied with information Community activities and appropriate Commission representation at EUREKA proj events also helps improve awareness. The Commission represents the Community at EUREKA policy- and decision-making meetings and is involved in all relevant initiatives.

It is important to make greater use of the existing counselling and information n (CORDIS, VALUE, Relay Centres, OPETs etc.) and tools (e.g. expressions of interest ARCADE) at Community, EUREKA and Member State levels. The aim should be to systems more accessible to interested parties (researchers, industrialists and, in pa SMEs) and to ensure more transparent operation. However, the driving force must always from the demand side, with the mechanisms designed to be able to respond to real needs.

At the project proposal stage, both EUREKA and EC RTD programme management indicate to project consortia when the proposal is more suitable for the other mechanism. An important stimulus for improving synergy between EUREKA and EC RTD is the for EUREKA to help draw Commission-funded research results to the markets. This is of the major advantages of Commission participation in umbrella initiatives. information exchange and dissemination activities are used, such as publications (for e the EUROCARE newsletter), conferences (for example, EUROLASER) etc. In particular, special attention needs to be paid to giving an "early warning" of potentially exploitable results or future prospects where EUREKA might help pull through results.

Particular attention needs to be given to dissemination of the results of Community-fund projects and their take-up and continuation under EUREKA. A list of the major, open-access conferences likely to be of interest to EUREKA will be sent to the EUREKA Secretariat regularly. (A list of conferences is already published in RTD Info.)

Coordination at the project level

Mechanisms to encourage cooperation such as (but not exclusively) thematic networks, targeted research and concertation networks will be developed in close coordination with industry and the research community, subject to normal criteria on the quality and relevance of the proposed action. Such mechanisms should facilitate coordination with the relevant activities, including EUREKA.

EUREKA "umbrella" initiatives promote the generation of new activities in their respective areas and encourage the exchange of relevant information. Commission staff participate actively and systematically in all EUREKA umbrella initiatives in areas in which the Community is interested and active. Such initiatives represent an important mechanism for coordination between EUREKA and EC programmes and, in particular, help in the rapid take-up of ideas and the preparation of project proposals in a coherent framework.

A number of the measures taken to make the Community RTD activities more transparent will help improve the interface with EUREKA. This includes programming calls for proposals, fixed dates for calls with a minimum response time, regular information about activities, clear information about procedures and criteria, etc.

Particular emphasis should be placed on improved and regular contacts between Commission programme managers and EUREKA National Project Coordinators to ensure effective

coordination between activities. This should not lead to the creation of new administrative structures, but should be designed to help further improve information exchange between those directly involved in the two frameworks. The Commission intends to organize regular meetings to inform EUREKA NPCs of opportunities and procedures.

Standardization and associated activities

One important area of interest to both EUREKA and EC RTD is the transfer of results to support the preparation of standards and legislation. This is an area where Community and EUREKA activities play a complementary role. Such activities need to be planned to bring in all the relevant interests - customers, suppliers, legislators, standardization bodies, the research community, etc. Cooperation mechanisms should play an important part in this area.

Continuing activities

The Community participates in EUREKA through its Joint Research Centre and through its RTD programmes. In a number of cases, the JRC is a partner or leader in the action. It sees all proposals that fall within its (large) sphere of interest and comments on the merits of projects. It may seek to join particularly relevant "open" proposals. As the Commission's research establishment, the JRC has an important role in the development of coordination between EC RTD and EUREKA, and this was singled out for specific mention in the Hanover declaration on EUREKA.

The other way in which the Commission is financially involved is through funding (or part-funding) under shared-cost support programmes. In addition to the projects listed in the Annex, the Commission will investigate opportunities for additional involvement. Obviously, such participation must fit in with the normal project support criteria. However, participation in EUREKA could be a plus point from the point of view of the project appraisal policy.

A coherent framework for action

EC activities in specific areas of technology are defined following discussions with all interested parties to identify medium- and long-term needs. On the basis of the various inputs, the framework for action is drawn up. This "strategic" approach, which looks at both the technical and non-technical sides, can serve as a coherent framework for the identification of future priorities, not only for planning Community actions, but also for other public authorities. It will also help industry understand clearly the activities undertaken under the Community RTD programmes.

Invitations to submit proposals are published on the basis of these priority areas of interest, open to any suitable initiative from industry and the research community. EUREKA could take this focusing of Community RTD into account when it identifies its activities, in particular in joint promotional activities, workshops, brokerage events, etc. It is important to try to identify synergies in this way, drawing on the specific features of the two mechanisms, while avoiding introducing rigidities into the system.

FINANCIAL PARTICIPATION OF THE COMMUNITY IN EUREKA PROJECTS

EUREKA PROJECTS			COMMUNITY PARTICIPATION IN EUREKA PROJECTS	
Project Number	ACRONYM	TOTAL COST in MEcus	R&D COMMUNITY ACTIONS	DIRECT PARTICIPATION
6	EUROLASER	20	BRITE-EURAM	Umbrella Small financial participation
7	EUROTRAC	100	JRC	2.6
			ENVIRONMENT & JRC	7.1
8	COSINE (fin)	18	ESPRIT & VALUE	8.0
19	FORMENTOR	29	JRC	3.2
37	EUROMAR	1	MAST	Umbrella Small financial participation
495	EUROMAR - Visimar (fin)	2	JRC	Small participation
45	PROMETHEUS	765	1/3 of DRIVE I&II	20
72	FAMOS	1	BRITE-EURAM/ESPRIT	Umbrella, Small financial participation
283	SYNTHETIC TV	8	RACE & ESPRIT	
95	HDTV	848	VISION 1250 - Aids to operators and productors	5
127	JESSI	3800	ESPRIT	191
140	EUROCARE	7	BRITE-EURAM/ENV	Umbrella
367	EUROCARE - Granitic Rock	1	STEP (ENV)	Small participation
251	RIG: Oil Drilling (fin)	5	THERMIE	1.9
330	EUROENVIRON	< 1	JRC	Umbrella
618	EUROENVIRON - Tracy	< 1	JRC	0.1
674	EUROENVIRON - Mobile	6	JRC	0.9
500	JUMBOCOKE	20	THERMIE	0.2
658	CEFIR High Temp Fibres	< 1	JRC	0.1
693	MAINE	1	BRITE-EURAM/ESPRIT	Umbrella
718	EUROAGRI	< 1	AIR	Umbrella
726	TOLEDO PV-1 (fin)	12.6	JOULE/THERMIE	4.1
745	EUROVOLTAIC	< 1	JOULE	Umbrella
800	EUROSURF	=	JRC- IAM	Umbrella
807	EUROGAAS (definition phase)	4	ESPRIT	2 (cec)
929	ASSET	30	ESPRIT	15 (cec)
1061	EUROCAIRN (definition phase)	1	ESPRIT	0.5
27	TOTAL	5685		261.7 MEcus

(fin) Finished project

(cec) The CEC is the only financing body for the definition phase

ANNEX 6

Relationship between the EC and the EMBL

Current relationship

The relationship between the EC and the EMBL has always been built on a case by case basis subject to the principle of open competition for Community support. The projects to which the Commission has financially contributed have always been evaluated by independent experts in order to ensure scientific and technical excellence as well as relevance to the contents of the specific programmes. This approach has allowed this centralized laboratory to share its expertise and technical resources with many other laboratories in Europe in transnational consortia.

During the last few years, the EMBL has become an important point of reference for European research in molecular and cellular biology as it has started providing a number of important facilities with no equivalent in the Community, both because of their intrinsic character as a service supporting any research in the field, and, in some cases, because of their uniqueness resulting from the fact that only an international effort could afford the financial and human resources needed to maintain them (DNA data library, synchrotron radiation sources, etc).

On various occasions this new dimension to the EMBL's profile has allowed it, by applying the Commission's rules with respect to international cooperation, to initiate the establishment and development of research networks involving its concentrated facilities and the complementary skills of other laboratories across Europe. This synergistic effect can be seen as a factor for greater cohesion in European countries' activities on molecular biology.

Convergence of the efforts under the EMBL's own scientific programme and of certain activities under EC RTD programmes can be seen in some areas of molecular and cellular biology but not all, notably the plant sciences or the neurosciences, which are priorities in the specific programmes related to life sciences but have no equivalent at EMBL level. Bearing this in mind, this can only be referred to as circumstantial successful cooperation around themes of common interest rather than as a deliberate policy of convergence.

Future relationship

The EC and the EMBL recognize their long-standing tradition of interactions in areas of mutual interest, with the EMBL recruiting international teams to contribute useful scientific results and the EC financially supporting transnational efforts by established laboratories, including the EMBL, to assist the emergence of new technologies.

Both organizations wish to consolidate that base so as to promote synergies towards shared objectives, and mutually to benefit from each other's individual experience in developing competent networks upon which coherent European research in molecular and cellular biology may rest. Both parties see it as essential that any EC resources add value to and gain value from the contributions made to EMBL by its Member States in corresponding fields. They endeavour to optimize mutual understanding of their own functions, S&T activities and operational rules applicable to the establishment of a strong European science base in modern biology. They would in this regard seize any opportunity compatible with their range of missions that would produce, from their combined actions, a multiplier effect which would help to enforce the highest international quality standards in collaborative research as well as to promote the international competitiveness of the Community. Future arrangements should include a mechanism for exchange of information and concertation regarding the fundamental and enabling aspects of molecular and cellular biology, in so far as relevant to the objectives of the Framework Programme of Community activities in the field of research, technological development and demonstration and of the EMBL's own scientific programme.

Cooperation between the Commission and EMBL in the research, technological development and demonstration field may take, in particular, the following forms :

- regular exchange of views on research policies and planning at the EMBL and in the Commission;
- exchange of views on the prospects and on closer cooperation;
- regular updating on the international situation and on the understanding of respective responsibilities regarding programme, operational and infrastructure issues;
- coordination of programmes and projects carried out by EMBL and the Commission;
- joint action by EMBL and the Commission.

The cooperation may be implemented in the following ways:

- joint meetings;
- participation by experts in seminars, symposia and workshops,
- regular contacts between programme or project planners and managers,
- participation in joint action, subject to specified competition and review procedures,
- availability of documents and communication of the results of work carried out in the framework of this cooperation.
- Commission observer status in certain EMBL meetings.

The EC and EMBL will have to recognize and accept that their participation in relevant activities must comply with the rules and procedures of both organizations and the principles governing their operations. The EC will wish to ensure that any resources flowing to EMBL are subject to specified competition and review procedures and contribute to achieving the scientific and other objectives identified in the Fourth Framework Programme; the EMBL will wish to ensure that any activity is compatible with the Laboratory's scientific programme and its underpinning principles of excellence, cooperation and inclusiveness.

CERN and the European Community (EC)

Collaboration with CERN

Since the first Esprit programme was launched at the beginning of the 1980s CERN has taken an active part in a number of Community projects in fields where it has unique experience, most notably networks of computers and supercomputers. More recently, and in particular under the Third Framework Programme, CERN collaborated on the Human Capital and Mobility programme and made use of its expertise in the field of superconductivity.

In addition, regular contacts have been established and maintained between CERN and the JRC, and the Commission has observer status in the CERN Council.

In order to place the relations between the Commission and CERN on a sounder and more structured footing and to flesh out the broader European cooperation described in Articles 130 F *et seq.* of the Treaty establishing the European Community, the two parties have reached on 10 October 1994 an administrative arrangement defining their relations, which cover areas other than high-energy particle physics, CERN's main field of research.

Future relations between the CERN and the EC

In preparing the Fourth Framework Programme, the Commission allowed Europe's scientific organizations, including CERN, to participate fully in the relevant specific programmes and bring their expertise into play. In CERN's case the following areas were covered:

- Non-nuclear activities

* Information and communications technology
* Industrial technology
* Environment
* Life sciences and technology
* Non-nuclear energy
* Research towards a European transport policy
* Targeted socio-economic research
* Training and mobility of researchers

- Nuclear activities

* Nuclear safety and control measures
* Controlled thermonuclear fusion
* Applications of accelerator technology

Supplementary programmes and Community participations

1. Within the above context the rationale underpinning the Communication "Coordination through Cooperation" is to create the conditions necessary for the implementation of Articles 130 K and 130 L.

The current situation

2. These two articles are almost symmetrical since they both concern actions in which only certain Member States participate and which are implemented either at multinational or Community level:

   130 K concerns **Supplementary Programmes**, i.e. programmes decided on by the Community in which only certain Member States participate and for which the funding, though not a legally binding requirement, may be partially provided by the Community. Supplementary Programmes are therefore Community actions.

   130 L concerns **Community Participations** in programmes undertaken (i.e. agreed, financed and implemented) by certain Member States in which the Community may make a financial contribution. Community Participations are therefore multinational actions.

3. These actions, being RDT activities, must remain fully within the Framework Programme and satisfy its objectives. **All funding must be provided by the Framework Programme.**

4. The implementation of the Framework Programme must take place through the Specific Programmes (Article 130I) and may also resort to Supplementary Programmes and Community Participations. Articles 130K and 130l provide for this possibility.

5. The Fourth Framework Programme explicitly includes provisions for the use of these articles (Article 2 paragraph 2 of the Decision on the Framework Programme).

Difficulties.

6. Whereas the proposal for the Framework Programme did not extend to the level of the Specific Programmes, the Council and the Parliament have indicated the financial breakdowns between these Programmes which total to the overall budget for the Framework Programme. As a result, the realization of any Supplementary Programme or Community Participation can only take place within Specific Programmes.

7. However, one of the advantages of possible actions in this context comprises in particular the grouping of actions using technologies arising from different programmes around objectives of Community interest. In consequence, these actions have to be funded by these different programmes. It is necessary, therefore, in addition to the usual

problems associated with coordination, to find solutions to the legal and management problems arising from the particular responsibilities of each Programme Committee.

8. In reality, however, there are two **main problems:**

- The Member States involved must decide on a given theme and mobilize together their own financial resources to which the Community may make an important but limited contribution.

- Even though each action must be subject to an individual decision, the presentation of packages of actions would facilitate Member States' acceptance of Community contributions to individual programmes in which, on a case-by-case basis, only some States would directly benefit (Community interest).

The proposed approach.

9. **To overcome these difficulties a new political willingness for better cooperation between Member States is needed. This is the objective of this Communication. Hence, if a favorable climate is created it could be possible to launch pilot actions using a part of the 700 MECU to be decided on in mid-1996.**

10. The establishment of this political willingness will also rest on the clarification of certain specific aspects of these Supplementary Programmes and Community Participations. It is proposed, therefore, that the **criteria** linked to the verifications of **Community interest** as well as the **modus operandi** to be followed should be examined. In particular, **the possibility of other Member States** having access to these actions as well as **the rules governing the dissemination of know-how**, factors which determine the feasibility of such actions, must be studied.

11. The solutions envisaged is to reserve a specific budget-line in future decisions on Framework Programmes for funding actions on the basis of Articles 130K and 130L. In order to ensure that the Fifth Framework Programme will be fully operational as regards this point, it is recommended that pilot actions be launched. The co-decision expected for mid-1996 regarding this 700 MECU offers this possibility. The Commission could take that opportunity, to propose that a part of this sum be reserved for these pilot actions, with the rest being allocated to existing programmes.

12. As regards the themes, the accent should be placed on objectives with wide-ranging coverage involving Community interest such as "key" components, rather than on objectives such as the "clean car" which would be both too sectoral and too costly. The services concerned (DG XII,XIII & III) have identified a number of concrete examples which could constitute the first pilot projects in the following domains:

1. Lightweight batteries (for the clean car)
2. Applied aerodynamics (improvements to engine and wing efficiencies, noise reduction).
3. Advanced systems for establishing a new European potential with regard to observation, surveillance and exploitation of the sea-bed.
4. Research on primates.

13. A necessary condition leading to the implementation of these actions, and going beyond the organization of preliminary contacts at high level in Member States via Research Ministries, is the need for open and indepth discussions with all Member States. In essence this is what the Communication is proposing.

ANNEX A

A1 - Estimate of public funding of RTD in the Member States and the four EFTA-EEA countries due to accede to the Union and funding through Community research activities and the other European frameworks of S&T cooperation (1992)

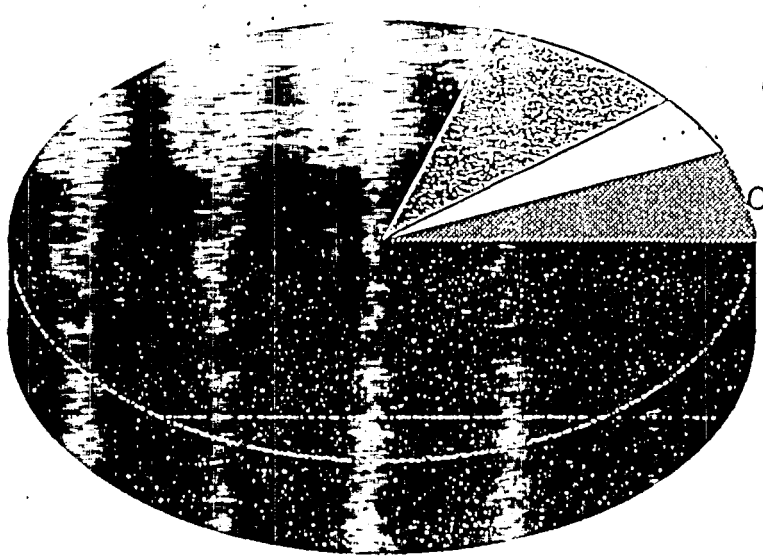
- Breakdown of government R&D appropriations by country in the EEA (1985, 1991 and 1992)
- Comparison of public funding of RTD from 1985 to 1992: USA/Japan/Europe (of 12 and 16)

A2 Fact sheets on cooperative European RTD endeavours

A3 Fact sheets on national RTD policies in the Member States

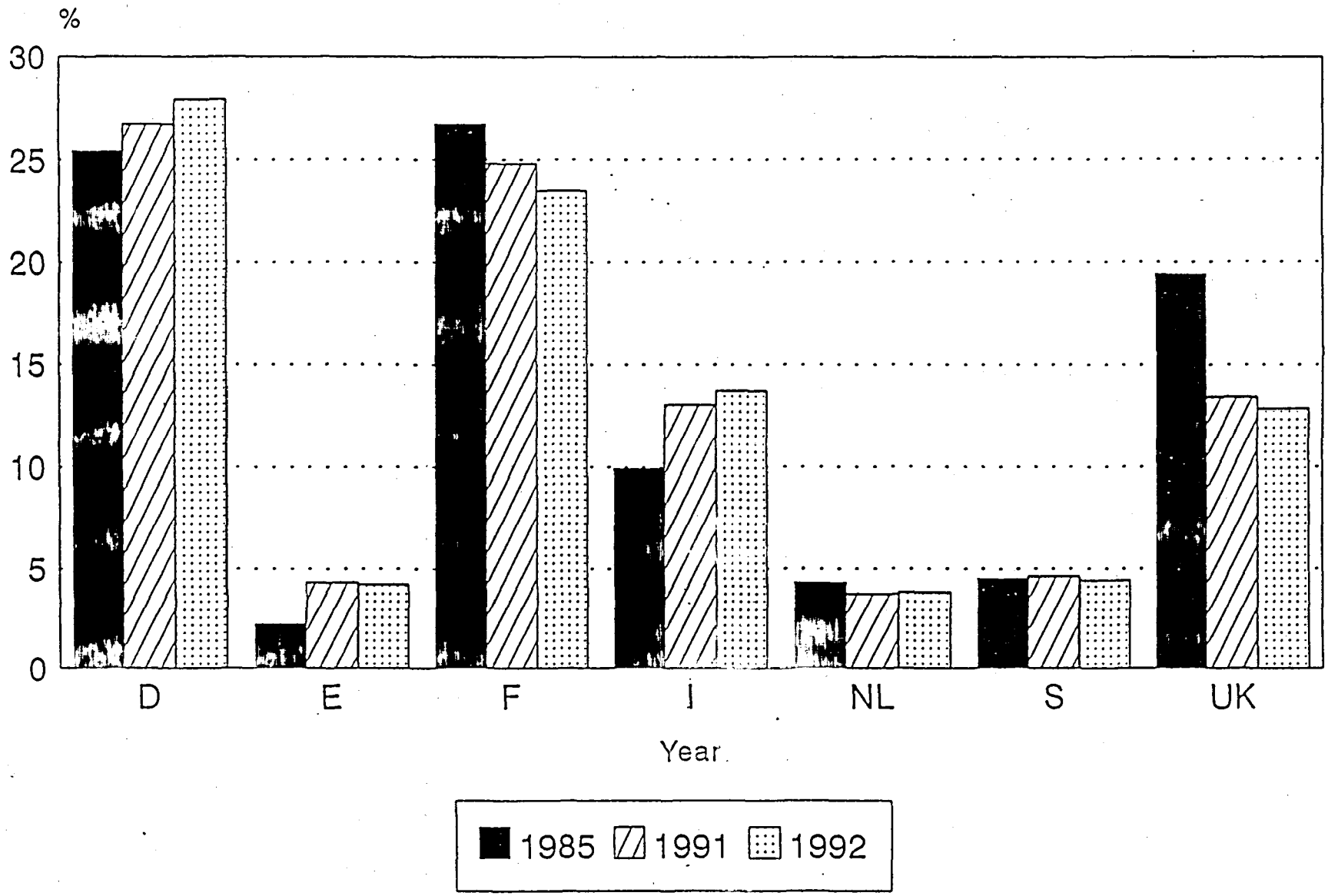
ANNEX A1

Estimate of public funding of RTD in the Member States and the four EFTA-EEA countries due to accede to the Union and funding through Community research activities and the other European frameworks of S&T cooperation (1992)



(Total: around ECU 62 400 million)

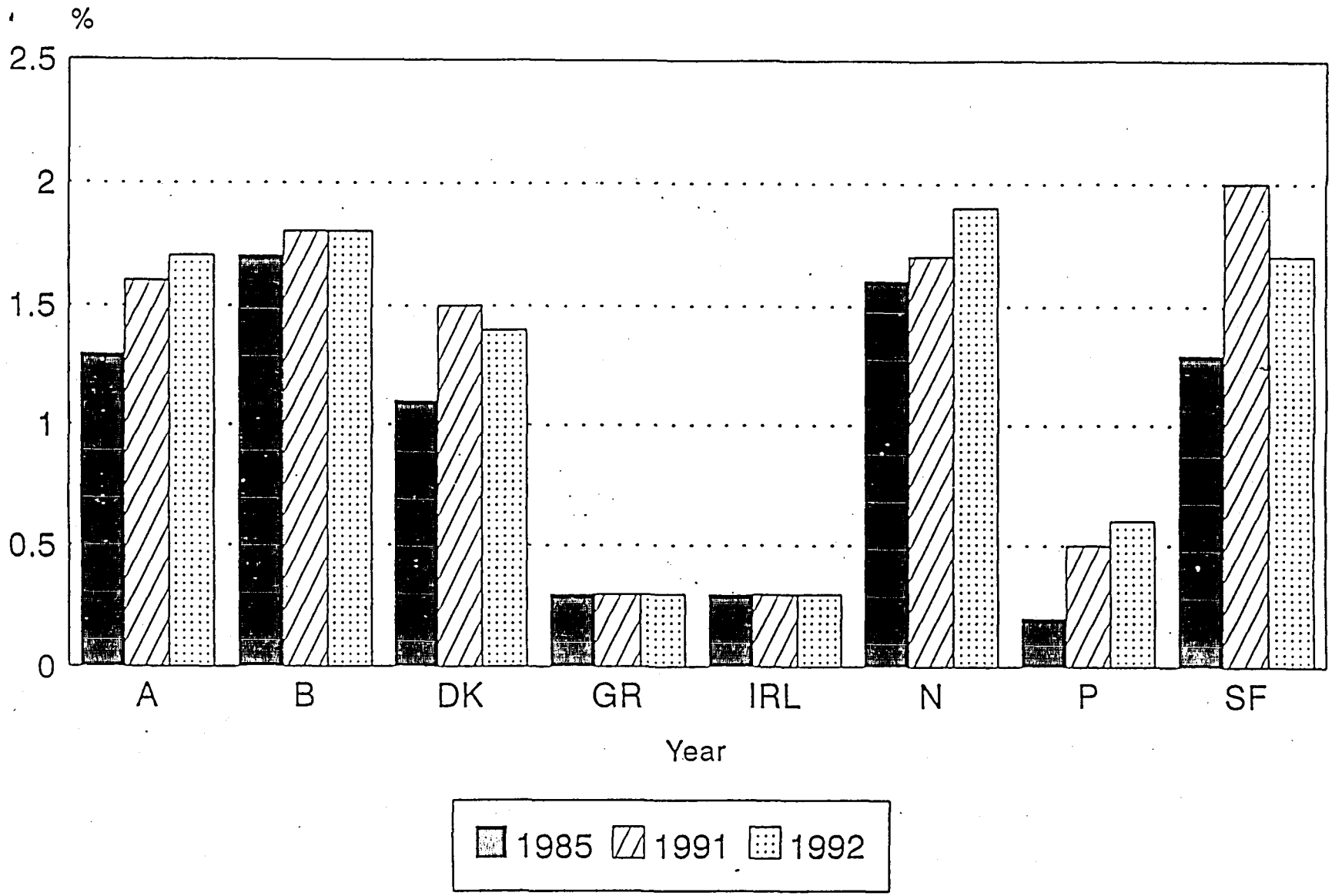
1985, 1991 et 1992 aux prix et taux de change courants (EEE=100%)



IS, FL et L exclus

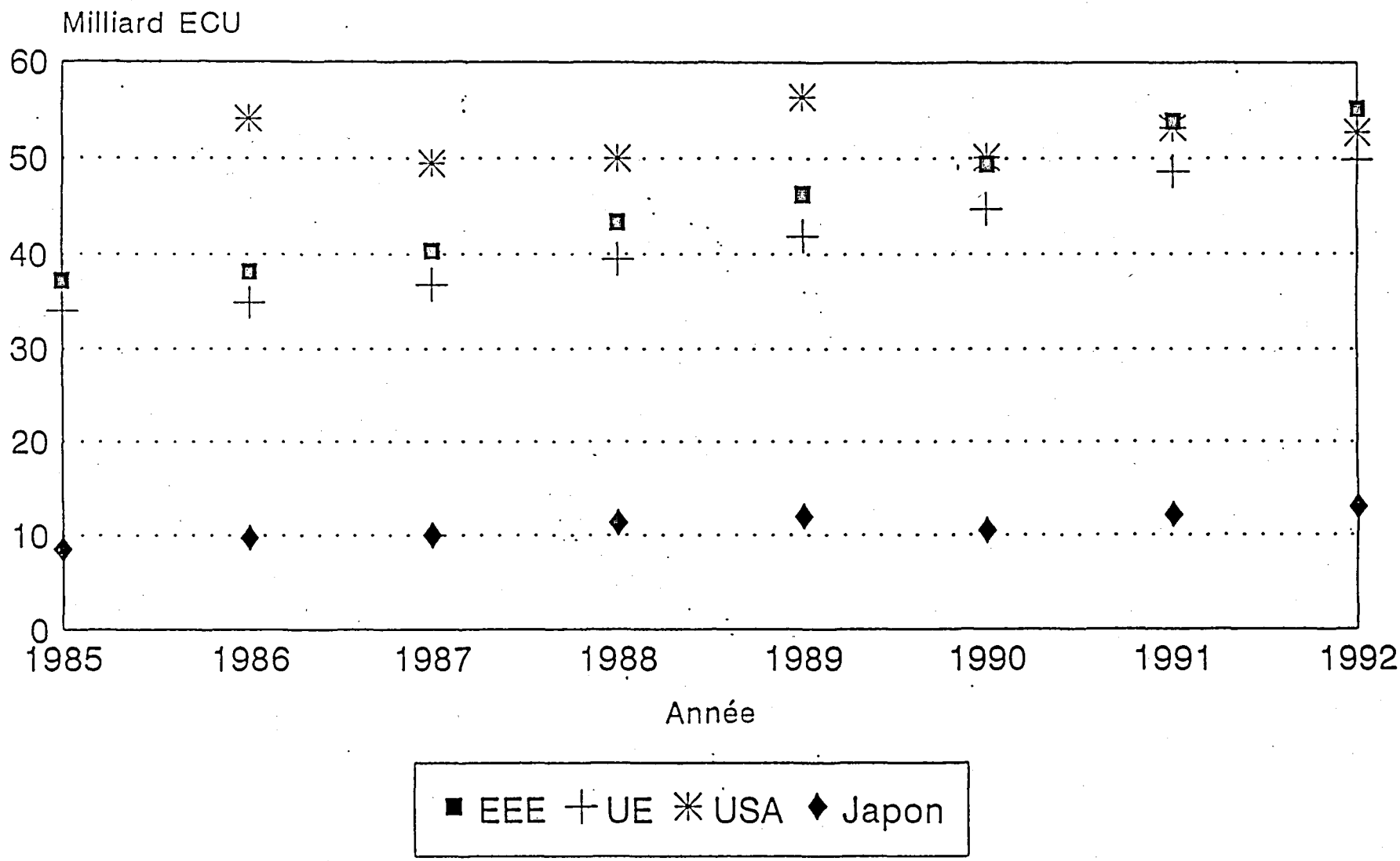
Distribution par pays des crédits budgétaires publics de R-D dans l'EEE

1985, 1991 et 1992 aux prix et taux de change courants (EEE=100%)



IS FL et L exclus

prix et taux de change courants



données non disponibles en 1985 pour les USA
données systématiquement sous-estimées pour le Japon
Sources: Eurostat pour l'UE et l'EEE. OCDE pour les USA et le Japon

Fact sheets on cooperative European RTD endeavours

Contents

Participation of the European Member States and Austria, Finland, Norway and Sweden in Cooperative European RTD Endeavours.

Organisation	Annual budgets[1]	B	DK	D	GR	ES	F	IRL	I	LUX	NL	P	UK	A	FIN	NOR	SWE
CERN	590 MECU[2]	x	x	x	x	x	x		x		x	x	x	x	x	x	x
COST	400 MECU[3]	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
EMBL	49 MECU[3]	x	x	x	x	x	x		x		x		x	x	x	x	x
EMBO	7.9 MECU[3]	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
ESA	2967 MECU[2]	x	x	x		x	x	x	x		x		x	x		x	x
ESF	9.3 MECU[3]	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
ESO	62 MECU[4]	x	x	x			x		x		x	x[9]					x
ESRF	68.8 MECU[4]	x[6]	x[7]	x		x	x		x		x[6]		x		x[7]	x[7]	x[7]
EUREKA	1500 MECU[5]	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
ILL	47 MECU[4]			x		x[8]	x						x	x[8]			
Total	5701 MECU																

1 Many of these figures are approximations- refer to information sheets attached.
2 1992 figure
3 1994 figure
4 1993 figure
5 Likely to be an over-estimation: 13500 MECU engaged during the last 9 years ('85 to '94) since the programme was launched, comprising expenditure which will be incurred in subsequent years and includes substantial private (industrial) funding.
6 Belgium and The Netherlands participate in ESRF as a consortium: BENESYNC.
7 Denmark, Finland, Norway and Sweden participate in ESRF as a consortium: NORDSYNC.
8 Associated members
9 Cooperation agreement

ECU conversions figures used : 1ECU= 1.6SF; = 2.02DM; = 6.85FF.

FACT SHEET FOR EUROPEAN SCIENTIFIC FACILITIES AND ORGANISATIONS

NAME European Organisation for Nuclear Research (CERN) SITE Switzerland-France

EXPENDITURE 582 MECU (1994) PERSONNEL 2991 (1993)

ORGANISATIONAL MECHANISM CERN was established by international convention in 1954 enjoys intergovernmental status.

PARTICIPATING NATIONS (19) The current Member Nations are: *Austria*, Belgium, Czech Republic, Denmark, *Finland*, France, Germany, Greece, Hungary, Italy, The Netherlands, *Norway*, Poland, Portugal, Slovak Republic, Spain, *Sweden*, Switzerland, UK.

CONDITIONS OF PARTICIPATION Individual contributions are related to GNP. New members begin their contribution at a low level, which in time is brought into line with their GNP. The international treaty is open-ended, and allows for withdrawal from CERN only after a two-year notice period.

GENERAL OBJECTIVES To promote high-energy particle physics; to probe the innermost constituents of matter in order to obtain a better understanding of how the world and the universe works. This is achieved by the construction and operation of a series of particle accelerators/colliders and associated detectors.

MAJOR S&T THEMES High-energy particle physics, plus the necessary technological support for the accelerators and instrumentation, along with supporting computer facilities.

TYPES OF COOPERATION There are several different types of installation maintained at CERN: Amongst the flagship high-energy accelerators are the Proton-Synchrotron, the Super Proton Synchrotron (SPS) proton-antiprotoncollider, and the Large Electron Positron collider (LEP). In addition to these installations there is the isotope on-line separator (ISOLDE), the Low Energy Antiproton Ring (LEAR), and the Fixed Target SPS Experimental areas. Experiments using these installations are equipped and carried out by (often very large) teams of physicists from Member Nations and the rest of the world, assisted by permanent CERN research staff in the spirit of fostering international collaboration. CERN hosts 6-7000 visitors per year, which averages out to a full-time equivalent additional staff of approximately 2500. The user community is very international in character, and is far from limited to Europe. For example, in 1993 there were 400 to 500 physicists each form the Russian Federation and America.

MANAGEMENT STRUCTURES The CERN Council decides issues of major importance, and usually meets twice a year. It is composed of two representatives per Member Nation who act on behalf of their governments, and also has some non-Member Nation representatives present in an Observer status (Israel, the Russian Federation, Turkey, CEC and UNESCO). Assisting the Council are three important committees: Committee of Council, which identifies and discusses major issues or difficulties before Council sessions; Finance Committee, with special responsibility for budgetary, contractual and other financial matters; and Scientific Policy Committee, responsible for advising the Council on research programmes and options. Overall executive authority lies with the Director-General. There are several Directors, with responsibility for Research, Accelerators, Administration and Technical Support. Under them are several more Divisions, with associated Divisional Heads. In addition to this structure are the Research Board, the Management Board and the Standing Concertation Committee.

FACT SHEET FOR EUROPEAN SCIENTIFIC FACILITIES AND ORGANISATIONS

NAME European Molecular Biology Laboratory (EMBL) SITE Heidelberg, Germany

EXPENDITURE 498 MECU (estimated, 1994) PERSONNEL 722 (1994)

ORGANISATIONAL MECHANISM The EMBL was established by an intergovernmental agreement in 1973. It thus has "international" status. There are also some EMBL outstations, situated at DESY in Hamburg, the ILL/ESRF site in Grenoble, and in Cambridge (re-named the European Bioinformatics Institute).

PARTICIPATING NATIONS (15) The Member States are *Austria*, Belgium, Denmark, *Finland*, France, Germany, Greece, Italy, Israel, The Netherlands, *Norway*, Spain, *Sweden*, Switzerland, UK.

CONDITIONS OF PARTICIPATION Member Nations contribute to EMBL in proportion to their GNP.

GENERAL OBJECTIVES To undertake research in molecular biology.

MAJOR S&T THEMES Molecular Biology. Research programmes include Biological Structures and Biocomputing, Cell Biology, Differentiation, Gene Expression, Physical Instrumentation and Biochemical Instrumentation.

TYPES OF COOPERATION The EMBL employs scientists from the Member Nations and the rest of the world in order to carry out its programme of experiments on-site. Personnel are recruited according to merit, and there is not a policy of ensuring geographical return to the Member Nations.

MANAGEMENT STRUCTURES There is an EMBL Council, that meets annually and is attended by representatives of the member states, and is responsible for approving the budget, the scientific-programme and appointing the Director-General. The Scientific Advisory Committee is responsible for preparing the scientific programme. Internally, the facility is governed by the Director General. The DG has day-to-day responsibility for management of the facility. There are also several divisions: some are based upon scientific programmes, whilst others operate at a functional level (computing, administration etc.).

FACT SHEET FOR EUROPEAN SCIENTIFIC FACILITIES AND ORGANISATIONS

NAME European Space Agency (ESA) SITE Various

EXPENDITURE 2967 MECU (1992, Payment Appropriations) PERSONNEL 2064 (1992)

ORGANISATIONAL MECHANISM ESA was established by an international Convention in 1975, and originated from the merging of 2 earlier organisations (ESRO, ELDO) established in 1964. Each site has international status.

PARTICIPATING NATIONS (15) The full Members are: *Austria*, Belgium, Denmark, France, Germany, Ireland, Italy, The Netherlands, *Norway*, Spain, *Sweden*, Switzerland and the UK. *Finland* is an Associate Member (Full Member from 1995), whilst Canada has a Cooperation Arrangement.

CONDITIONS OF PARTICIPATION ESA manages two types of R&D programme: Mandatory and Optional. The Mandatory programme contains basic and science activities (e.g. technology and satellites), and all Members must contribute to these activities according to GNP. There are five Optional programmes and Members decide which of these programmes they wish to join. Their contribution is then based upon GNP, plus an amount that is dependant upon the optional programmes they have decided to participate in.

GENERAL OBJECTIVES "To provide for and promote, for exclusively peaceful purposes, cooperation among European States in the fields of Space Research and Technology and Space Applications, for scientific purposes and for operational space applications" (Article 2 of the ESA Convention).

MAJOR S&T THEMES Mandatory activities include Science and Technological research programmes, encompassing basic multi-disciplinary research. The optional programmes are: Telecommunications, Observation of the Earth and its Environment, Space Transportation Systems, Space Station and Platforms, and Microgravity research.

TYPES OF COOPERATION There are several ESA sites throughout Europe. ESA Head office is located in Paris, and is responsible for the bulk of administration. Other sites are the European Space Research and Technology Centre (ESTEC) in The Netherlands, the European Space Operations Centre (ESOC) in Germany, the European Space Research Institute (ESRIN) in Italy, the European Astronauts Centre (EAC) in Germany plus several other smaller offices and ground stations, including the Launch Site in French Guinea. An industrial procurement policy aims at ensuring that contracts are shared out to Member countries in proportion to their national ESA contribtuion. Approximately 90% of the ESA budget is spent with industry.

MANAGEMENT STRUCTURES The principal external governing body is the Council, to which each Member nation sends a delegation, and which has responsibility for approving the programmes and budgets and other major decisions. There are also Programme Boards, and several committees, including the Science Programme Committee, the Administrative and Finance, an Industrial Policy Committee and the International Relations Committee. ESA is managed by the Director General, assisted by the Inspector General, Cabinet, and Associate Directors. Each Mandatory and Optional Programme also has a management board.

FACT SHEET FOR EUROPEAN SCIENTIFIC FACILITIES AND ORGANISATIONS

NAME European Southern Observatory (ESO) SITE Garching, Germany (HQ) & Chile

EXPENDITURE 62 MECU (Estimated, 1993) PERSONNEL 300 (approx, 1994)

ORGANISATIONAL MECHANISM The ESO was established by an intergovernmental treaty in 1962. The HQ has international status.

PARTICIPATING NATIONS (9) Belgium, Denmark, Germany, France, Italy, The Netherlands, *Sweden*, Switzerland, plus a cooperation agreement with Portugal.

CONDITIONS OF PARTICIPATION Members contribute an amount in proportion to their GNP.

GENERAL OBJECTIVES To construct and operate astronomic facilities.

MAJOR S&T THEMES Astronomy.

TYPES OF COOPERATION The Headquarters at Garching is the scientific centre of the organisation. It houses the Office of the Director General, the Administration, the VLT Division and the Scientific Division, as well as the Space Telescope European Coordinating Facility (a joint ESO/ESA Group responsible for the use of the Space Telescope in Europe). The observatory at La Silla in Chile is the site of a large number of telescopes, and the requisite electronic, optical and mechanical workshops and a computer centre. There is also activity at Mount Paranal in Chile, where ESO is building the VLT (see later).

MANAGEMENT STRUCTURES Externally, ESO is overseen by a Council, upon which representatives from the Member States sit. There are several committees that assist the Council in its operation: Committee of Council, Scientific and Technical Committee, Finance Committee, Observing Programmes Committee and Users Committee. Day-to-day management is left in the hands of the Director General, whose office is located in ESO HQ, along with the Administration Division. The La Silla Observatory has an integrated structure, and is managed separately.

FACT SHEET FOR EUROPEAN SCIENTIFIC FACILITIES AND ORGANISATIONS

NAME EUREKA SITE Distributed Programme

EXPENDITURE over 14.5 billion ECU since 1985 PERSONNEL see below

ORGANISATIONAL MECHANISM EUREKA is a pan-European distributed programme of collaborative R&D involving firms, universities and research institutes, with a bottom up mechanism whereby consortia form and can gain EUREKA status and funding for nearer market R&D in advanced technologies. It was launched in 1985 under a French initiative.

PARTICIPATING NATIONS (23) *Austria*, Belgium, Denmark, EU, *Finland*, France, Germany, Greece, Hungary, Italy, Ireland, Iceland, Luxembourg, Netherlands, *Norway*, Portugal, Russia, Slovenia, Spain, *Sweden*,
Switzerland, Turkey, United Kingdom.

CONDITIONS OF PARTICIPATION To be awarded EUREKA status projects must involve cooperation between participants of more than one Eureka Country, use advanced technologies for civilian applications, and be market-oriented. Once EUREKA status is awarded, participants must approach their national governments for part-funding. Each Member Country has different funding rules. EUREKA status does not guarantee funding. Projects may include participants from non-member countries.

GENERAL OBJECTIVES To increase European productivity and competitiveness through closer cooperation between firms and research institutes in advanced technologies, developing products, processes and services with a world market potential.

MAJOR S&T THEMES EUREKA is bottom up and very diverse, but the projects are classified into the following technological areas: IT, communications, materials, medical and biotechnology, lasers, environment, transport, robotics and production automation and energy.

TYPES OF COOPERATION The projects are consortia-based, ranging from a few partners to large initiatives such as the Joint European Sub-micron Silicon Initiative (JESSI). In some areas umbrella projects have been formed to create networks in order to stimulate new projects, for example the EUROENVIRON projects. Participants decide their own arrangements for managing the consortia and the intellectual property. Some of the projects are aimed at standards.

MANAGEMENT STRUCTURES Each country has a National Project Coordinator for administration of applications. There is a small secretariat in Brussels which maintains a database of participants and produces promotional material. An annual Ministerial Conference awards EUREKA status to new projects and guides the overall direction, with the support of a High Level Group of senior representatives of the member countries.

FACT SHEET FOR EUROPEAN SCIENTIFIC FACILITIES AND ORGANISATIONS

NAME Euro.Cooperation in the Field of Scientific and Technical Research (COST) SITE Brussels (Sec)

EXPENDITURE 400 MECU (National res. funding, approx, 1994) PERSONNEL 28 (Sec)

ORGANISATIONAL MECHANISM COST Cooperation was established in 1971 by a Ministerial Conference. Its main body is the Committee of Senior Officials (CSO), composed of representatives of the 25 COST countries, the Council of the EU and the CEC. It is responsible for the overall strategy of COST, and takes decisions on every individual COST proposal. A CSO member of each country has the role of National Coordinator, which involves managing the COST Actions in their own country. There is a Working Party on Legal, Administrative and Financial questions, whose main task is to examine and give its opinion on questions submitted by the CSO, and is mainly composed of COST Senior Officials. The COST Secretariat is composed of two parts: The secretariat for the CSO and for Committees of a horizontal nature is provided by the General Secretariat of the Council of the EU.The Secretariat for the Technical and Management Committees is provided by the CEC.

PARTICIPATING NATIONS (25) *Austria*, **Belgium**, Croatia, Czech Republic, **Denmark**, *Finland*, **France**, **Germany**, **Greece**, Hungary, Iceland, **Ireland**, **Italy**, **Luxembourg**, *Norway*, Poland, **Portugal**, Slovak Republic, Slovenia, **Spain**, *Sweden*, Switzerland, **The Netherlands**, Turkey, **UK**.

CONDITIONS OF PARTICIPATION There are four basic principles underlying COST mechanisms: 1 All COST member countries, as well as the CEC, can propose COST Actions. 2 Participation in these Actions is voluntary. 3 The research to be coordinated is funded nationally. Coordination costs are funded both by the participating countries and by the CEC. 4 The cooperation takes the form of "concerted actions", which is the coordination of national research projects.

GENERAL OBJECTIVES To provide a framework for R&D co-operation, allowing for the coordination of national research on a European level. COST Actions consist of precompetitive or basic research or activities of public utility.

MAJOR S&T THEMES Multiple. There are currently over 100 COST Actions in progress. COST Actions at present exist in: informatics, telecommunications, transport, oceanography, materials, environment, meteorology, agriculture and biotechnology, food technology, social sciences, medical research, civil engineering, chemistry, forests and forestry products, fluid dynamics.

TYPES OF COOPERATION Any COST country can join any Action by signing a "Memorandum of Understanding", which is the legal basis of the Action even though it in fact ressembles a "gentleman's agreement" and an is expression of good faith rather than a formal and legally binding document. This MoU governs the joint aims, the type of activity to be pursued, the terms of participation and compliance with both sovereignty and if necessary, intellectual property rights. The signature of the MoU by at least 5 participating countries enables the entry into force of the Action. Research is nationally funded, whilst Community funding covers the coordination costs, and the CEC also reimburses the travel costs of the national delegates of the EC countries acting as members of the COST Management Committees. Each national delegate has a role of coordinator for that Action in his/her own country, and is in particular responsible for the distribution of information.

MANAGEMENT STRUCTURES Each Action is overseen by a Management Committee composed of experts in the field, representing the countries participating in that Action. The Management Committee is responsible for the detailed planning, execution and supervision of the work carried out during an Action, lasting 5 years on average. Technical Committees may also be set up by the CSO for a limited period (1-3 years) to provide expert advice within (currently 8) given S&T domains.

FACT SHEET FOR EUROPEAN SCIENTIFIC FACILITIES AND ORGANISATIONS

NAME European Molecular Biology Organisation (EMBO) SITE Heidelberg, Germany (HQ)

EXPENDITURE 7.9 MECU (approx, 1994) PERSONNEL 3 (1994, administration)

ORGANISATIONAL MECHANISM The EMBO is a private organisation of individual scientist members, registered in Geneva as an incorporated association under provisions of Article 60 and the following, of the Swiss Civil Code. The European Molecular Biology Conference from which it receives its funding was established by an intergovernmental agreement signed in 1969.

PARTICIPATING NATIONS (20) *Austria*, Belgium, Denmark, *Finland*, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, The Netherlands, *Norway*, Portugal, Spain, *Sweden*, Switzerland, Turkey, U.K. The EMBO has over 700 ordinary members, and 31 associate members.

CONDITIONS OF PARTICIPATION Contributions to EMBC are set every three years on a scale which sets each countries percentage contribution.

GENERAL OBJECTIVES To promote molecular biology within the Member Nations. This is done through the award of short and long term fellowships, and the organisation of exchanges, courses and workshops.

MAJOR S&T THEMES Molecular Biology

TYPES OF COOPERATION The long-term fellowship programme consumes approximately two-thirds of the annual budget. It is intended for advanced training through research, and facilitates this through the provision of an annual stipend, an allowance for each dependent, and a travel grant, for fellowships lasting from one to two years. Selection of long-term fellows is made twice-yearly, and in 1988 131 awards were made in response to 455 applications. There is also a short-term fellowship programme aimed at facilitating collaborative projects, between laboratories in the different Member States of the EMBC. These are awardedfor 1 week - 3 months, and provide a daily subsistence allowance and a travel grant. The programme of courses and workshops was part of the original programme for EMBO, and now approximately 18 workshops per year are sponsored, along with a similar number of practical courses and a few lecture courses.

MANAGEMENT STRUCTURES The EMBC meets twice a year in Heidelberg, and is made up of delegates representing the governments of Member States. It sets the three-year financial ceiling, votes the annual budgets and approves every 3 years the scale of contributions which sets each country's percentage contribution. The EMBO Council comprises ten elected and five coopted members and meets annually, usually in Heidelberg. It decides policy matters and can amend the Organization's rules. It co-opts annually two Council members, and also appoints personnel to senior executive positions within the Organisation. It scrutinizes the list of candidates nominated by the membership for each annual membership election and decides the number to be elected, and directly appoints to the membership no more than ten of the candidates who are from either EMBC countries or scientific areas that are poorly represented in the membership. There are two important EMBO Executive Committees that both meet bi-annually: The Course Committee and the Fund (Fellowship) Committee. The EMBO Secretariat is constituted by the Secretary General and the Executive Secretary. The daily business, both scientific and financial, is managed by the Executive Secretariat and two secretaries, with offices in the EMBL at Heidelberg. The Executive Secretary is responsible for the papers and minutes of the Conference's meetings, for proposing the annual budgets and for calling up financial contributions from the Member States.

FACT SHEET FOR EUROPEAN SCIENTIFIC FACILITIES AND ORGANISATIONS

NAME European Synchrotron Radiation Facility (ESRF) SITE Grenoble, France

EXPENDITURE 68.8 MECU (1993, Estimated) PERSONNEL 280 (approximate)

ORGANISATIONAL MECHANISM The ESRF has the status of a société civile under French law. It is governed by an intergovernmental agreement between scientific organisations within the Member Nations. It is only now beginning to enter its operational phase.

PARTICIPATING NATIONS (12) There are twelve nations who participate as eight members. The individual contracting nations are France, Germany, Italy, UK, Spain and Switzerland. The remaining countries participate as two consortia. The first, BENESYNC, represents Belgium and The Netherlands. The second, *NORDSYNC*, represents *Denmark, Finland, Norway and Sweden.*

CONDITIONS OF PARTICIPATION When registered as a société civile 10,000 shares of 10FF each were issued and distributed amongst the Members according to their contribution to operating costs. There is a minimum contribution rate of 4%. Contribution rates were originally fixed for 20 years, with an 11 year budget profile which was meant to take the project to the end of the construction phase. Contributions once operation have been achieved are: France, 27.5%; Germany, 25.5%; Italy, 15%; UK, 14%; BENESYNC, 6%; NORDSYNC, Switzerland and Spain, 4%. These figures do not correspond to contributions during the construction phase.

GENERAL OBJECTIVES To construct and operate a state-of-the-art high energy (6GeV) synchrotron with 30 x-ray beamlines for multi-disciplinary experiments. As such,it is set up as a user-oriented service facility.

MAJOR S&T THEMES The ESRF is optimised to the continual production of hard X-rays that can be used for a whole variety of purposes. Examples of applicable fields are Chemistry, Physics, Material Science, Biology and Medicine. There is also a theory group, and supporting instrumentation and computing divisions.

TYPES OF COOPERATION 30 public beam-lines have been envisaged, and these will all be available for peer reviewed research by 1998. In addition, up to 20 bending magnet beamlines will be available to external Collaborating Research Groups (CRG) made up of groups or consortia from the participating countries. A third of the beam-time on CRGs will be available for general ESRF users. The ESRF is planning for approximately 3000 visitors per year by 1996, with each visitor staying for three or four days.

MANAGEMENT STRUCTURES The principal external organ of the ESRF is the Council, which approves (amongst other important policy issues) arrangements for longterm use of ESRF by organisations from non-participating countries, financial rules, medium-term scientific programme, annual budgets etc. Each Contracting Party appoints a delegation composed of up to three delegates. It meets at least twice a year, and is supported by several other committees: Administrative and Finance Committee, Purchasing Committee, Audit Committee, Science Advisory Committee and the Machine Advisory Committee. The internal structure consists of a Board of Directors and related central services, and five Divisions. The former consists of the Director General, who is the Chief Executive of the Facility, and is assisted by five Directors: the Project director, two Research Directors and the Director of Administration. The five Divisions are Experiments, Machine, Technical Services, Computing Services and Administration. In addition to this, there is a Works Committee and a Committee on Health, Safety and Working Conditions.

FACT SHEET FOR EUROPEAN SCIENTIFIC FACILITIES AND ORGANISATIONS

NAME Institut Max von Laue-Paul Langevin (ILL) SITE Grenoble, France.

EXPENDITURE 47 MECU (1993) PERSONNEL 382 (1993)

ORGANISATIONAL MECHANISM The ILL has the status of a société civile under French law. It was set up by scientific organisations of the three Member Countries according to the forms of an intergovernmental agreement.

PARTICIPATING NATIONS (6) The Member Nations are France, Germany and the UK. The ILL has concluded special contracts of "scientific membership" with *Austria*, Spain and Switzerland.

CONDITIONS OF PARTICIPATION The three Member Countries share the operational costs between themselves, with the UK having re-negotiated a reduced commitment after 1.1.94. Scientific Members make a limited contribution to operational costs and in return receive access to the facility. There are three working languages - French, German and English.

GENERAL OBJECTIVES The ILL operates a 58MW High-Flux research reactor, used as a neutron source. As such, it is set up as a service institute, providing beam-time to its users with many experimental facilities for multidisciplinary applications.

MAJOR S&T THEMES Nuclear and fundamental physics; crystal and magnetic structures; structural andmagnetic excitations; liquids, disorders and defects in materials; biology; chemistry. There are also groups concerned with instrumentation design and operation, and computing.

TYPES OF COOPERATION The ILL is operating 25 instruments. Research proposals are received from scientists within organisations in the Member and Scientific Member Nations, and allocated according to scientific merit, although the scientific administration tries to ensure that overall allocation of beam-time matches contributions. Budget constraints have meant that the ILL has surplus instruments. These are to be operated by Collaborating Research Groups from Member Countries, under a contract with ILL. The ILL hosts up to 2000 visitors in a normal year, and the average experiment lasted for approximately five/six days.

MANAGEMENT STRUCTURES Externally, the ILL is overseen by a Steering Committee, upon which four delegates from each of the Member Nations sit. This is responsible for all major decisions, including the budget, personnel matters, the research programme and appointing the Director and other senior posts. There also a Scientific Council. This has 18 members when it sits in Plenary Session, and subcommittees with 66 members. Day-to-day responsibility for the facility lies with the Director, who is chosen from one of the member nations. The internal management consists of: the Director's Services (PR, Safety etc), the Science Division (Instrument groups, Scientific Colleges, library, Scientific Coordination), the Projects and Techniques Division (Instrument Operation and Development), the Reactor Division and the Administration Division.

FACT SHEET FOR EUROPEAN SCIENTIFIC FACILITIES AND ORGANISATIONS

NAME European Science Foundation (ESF) SITE Strasbourg, France (HQ)

EXPENDITURE 9.3 MECU (1994) PERSONNEL 28 (approx, 1994)

ORGANISATIONAL MECHANISM The ESF was established in 1974, and is an Association of its 55 member research councils, academies and other institutions devoted to scientific research in 20 countries.

PARTICIPATING NATIONS (20) Member Organisations are drawn from: *Austria*, Belgium, Denmark, *Finland*, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, The Netherlands, *Norway*, Poland, Portugal, Spain, *Sweden*, Switzerland, Turkey, UK.

CONDITIONS OF PARTICIPATION Contributions are made both to the ESF's basic budgets, to which Member Organisations contribute according to GNP, and to specific programmes and projects in which certain Member Organisations may have a particular interest.

GENERAL OBJECTIVES To bring European scientists together to work on topics of common concern, to co-ordinate the use of expensive facilities, and to discover and define new endeavours that will benefit from a co-operative approach; To sponsor basic research in the sciences.

MAJOR S&T THEMES Many scientific programmes encompassing Earth and Marine Sciences, Physics, Chemistry, Mathematics, Life Sciences, Humanities, Social Sciences.

TYPES OF COOPERATION ESF scientific work is organised in two modes: ESF Scientific Programmes, and ESF Scientific Networks. The former almost always contain teams of scientists who carry out research, are often long-term and are funded (except in the developmental phase) by participating Member Organisations. Networks discuss, plan, innovate, analyze or co-ordinate research, but seldom carry out large amounts of substantive research. They are usually short-term (three years), and are funded from the Network Account within the ESF basic budget. The ESF also jointly holds a Programme of European Research Conferences. These consist of a series of 1-week long scientific meetings on a general topic, spread over several years. The Chairman of each meeting has full responsibility for its scientific programme.

MANAGEMENT STRUCTURES The Assembly is the main decision-making body, meets annually and all Member Organisations are represented. The Executive Councilis composed of the President and Vice-Presidents, along with at least one elected member from each country with Member Organisations, and from a range of disciplines. It is responsible for the management of the ESF, and also prepares the work of the Assembly etc. The Board ensures the continuity of ESF business between Executive Council meetings, and is made up of certain personnel from that body, along with the Secretary General. Standing committees cover broad scientific disciplines. Their members are nominated by Member Organisations, and other experts can be added. They monitor ESF activities in their respective fields, set up working groups for specific problems, and prepare proposals for research support. Standing Committees co-operate in supporting interdisciplinary studies and issues of general interest. The Network Committee advises the Executive Council on Network matters, and makes recommendations for Network launches. A Steering committee is responsible for overseeing the European Research Conferences, whilst other committees are formed as necessary. The Office of the ESF is based in Strasbourg, and is directed by the Secretary General, who is appointed by the Assembly and has a small international staff for assistance.

Fact sheets on national RTD policies in the Member States

BELGIUM

GROSS DOMESTIC PRODUCT (GDP): ECU 179 995 million (1993) (at current prices and exchange rates) (c)

GROSS domestic EXPENDITURE on R&D (GERD): ECU 2 565 million (1990) (c)

GERD/GDP: 1.64% (1991) (c)

R&D BUDGET/NATIONAL BUDGET: 1.61% (1990)

PERCENTAGE OF GERD FINANCED BY THE STATE: 28% (1990)

PERCENTAGE OF GERD FINANCED BY INDUSTRY: 70.4% (1990)

TOTAL GOVERNMENT R&D BUDGET: ECU 1 145 million (1993)

DEFENCE R&D AS A % OF TOTAL GOVERNMENT APPROPRIATIONS: 0.2% (1992) (c)

NUMBER OF RESEARCHERS PER 1 000 LABOUR FORCE: 4.4 (1990)

MINISTRY RESPONSIBLE FOR S&T AND STRUCTURE OF S&T POLICY

At federal level: Ministry of Science Policy and Scientific and Cultural Institutions. Coordination of science policy is the responsibility of the Prime Minister's Federal Services for Science, Technology and Cultural Affairs (SSTC). which work closely with the main departments responsible for S&T (education, economic affairs, agriculture, health, etc.).

At regional and community level:

- In the Flemish-speaking Community the Chairman of the Government (as Minister responsible for science policy) is responsible for all S&T policy.
- In the French-speaking Community the Ministry of Education and Scientific Research is responsible for most R&D activities.
- In Wallonia the Ministry of Technological Development and Employment sees to the general coordination of the Executive's work on R&D.
- In the Brussels Region responsibility for R&D is shared by the Minister-Chairman of the Executive and the Minister for the Economy.

Federal coordination bodies: The Interdepartmental Conference on Science Policy (CIMPS) is the instrument for coordination between the authorities concerned (State, Regions and Communities).

PRIORITIES

At federal level:

- maintaining and stepping up the country's scientific potential
- associating Belgian research more closely with the globalization of R&D

At regional and community level:

- The Flemish Community is emphasizing increased public spending on R&D, better conditions for post-doctorate researchers, mobility of researchers and the conversion of university research findings into technology for use in industry.
- The French Community is placing particular emphasis on increased human resources and research potential.
- In Wallonia the aim is to increase the technological know-how of regional businesses and to promote dialogue between businesses, public authorities and universities.

TRENDS: Provisional estimates suggest that GERD has remained at around 1.69% of GDP since 1989, which is well below the EUR12 average (1.96% in 1991).

COMMENTS: Belgium's new federal structure (created by the 1980, 1988 and 1993 reforms) gives the Communities the main responsibility for basic and university research, while the Regions are mainly responsible for supporting industrial and technological research. The federal authorities are still responsible for the national research establishments, space research, the nuclear field and Belgian participation in international research bodies.

Data sources: National sources; OECD MSTI (1994-1) May 1994 report and OECD data bases; Eurostat.
(c) Estimate.

21/9/1994

DENMARK

GROSS DOMESTIC PRODUCT (GDP) :	117,486 Mio ECU (1993) (at current prices and exchanges rates)
GROSS DOMESTIC EXPENDITURE FOR R&D (GERD) :	1,787 Mio ECU (1991)
GERD/GDP :	1.69 % (1991)
PERCENTAGE OF GERD FINANCED BY GOVERNMENT :	39,7 % (1991)
PERCENTAGE OF GERD FINANCED BY INDUSTRY :	51.4 % (1991)
GOVERNMENT BUDGET APPROPRIATIONS FOR R&D :	738 Mio ECU (1992)
DEFENCE R&D BUDGET AS A % OF TOTAL GOVERNMENT APPROPRIATIONS FOR R&D :	0.6 % (1992)
NUMBER SCIENTISTS AND ENGINEERS ENGAGED ON R&D PER 1000 LABOUR FORCE :	4.1 (1991)

RESPONSIBLE MINISTRIES FOR S&T : The Ministry of Research and Technology and the Ministry of Industry.

STRUCTURE of S&T POLICY :
Each Ministry has responsibility for supporting research related to its function. Currently 17 ministries administrate the 738 Mio ECU R&D budget. Coordination takes place in the Interministerial Research and Technology Committee (DIFT) chaired by the Ministry of Research and Technology. The Danish Council for Research Policy and the 6 Research Councils advise the Parliament and the Government in research policy. The Danish Council for Research Policy is mainly responsible for research across sectorial boundaries. The Councils are supplemented by the Industry and Trade Development Council under the Minister of Industry. The overwhelming parts of the total R&D budget come from the Ministries of Education 37 %, Research and Technology 22 %, Agriculture 9 %, Industry 7 %, Cultural Affairs 6 %, and Health 4 % (1994 figures). The establishment of the Ministry of Research and Technology in 1993 was an innovation for Denmark. As a consequence, the responsibility of the National Laboratory RISO went from the Ministry of Energy to this new ministry.

NATIONAL PRIORITIES :
In general, the balance between basic research and strategic research must be maintained. The political task is the stimulation of research in areas where Denmark has already particular strength compared with other countries.
- Food technology (FØTEK) is an interministerial programme (1990-95) that concentrates on quality, optimal exploitation of raw material and processing but it also is an element in the government job-creating measures.
- In Materials technology the MUP II will be initiated in 1994. With grants of about 40 Mio ECU, it should also contribute to the job-creating policy.
- The Environment Research (40 Mio ECU for 1996-97) is established as a 7 ministries cooperation. The placing of the European Environmental Agency in Denmark will put an additional impetus on the research in this field.
- The Energy Research (66 Mio ECU per year) should support the formulation of the future energy policy. Major elements are power-saving technologies, integrated management of total household energy consumption and the Biomass Action Plan.
- Biotechnology is centred around the programmes BIOTEK I/II and covers the period 1988-95; within BIOTEK I the technology assessment (3 Mio ECU) takes place.
- Research on Elderly and Technology for Disabled has its tradition in DK and has been given priority by several Research Councils. In this field, research cooperation with the EC programmes on neuroscience and TIDE is foreseen.

TRENDS : After ten years of steady growth, the Danish R&D efforts are now stabilized at a level with those countries normally compared with Denmark. Emphasis will be put on increased quality and productivity and intensified application of research.

COMMENTS : International cooperation has gained importance and accounted in 1989 for about 9% of Government R&D funds. During the period 1990-93 these R&D funds will increase by 15 % (mainly for ESA, CERN and EUREKA). Denmark endeavours to have the EC programmes designed to complement and extend the national research. It received for many years more than 3 % of the EC research. The same percentage of the 1990-94 Framework Programme would amount to 3 % or 4% of the country's total R&D efforts. Denmark's contribution to the EC budget is about 2 % .

20/09/1994

Source : OECD MSTI (1994-1) May 1994; Exchange rates are from Eurostat, Manpower estimates from OECD database.

FEDERAL REPUBLIC OF GERMANY

...OMESTIC PRODUCT (GDP) : current prices and exchange rates)	1 598 993 Mio ECU (1993)
GROSS DOMESTIC EXPENDITURE for R&D (GERD) :	37 578 Mio ECU (1992)
GERD/GDP :	2.53 % (1992)
GOVERNMENT BUDGET APPROPRIATIONS FOR R&D AS % OF CENTRAL GOVERNMENT BUDGET :	4.31 %(1990)
PERCENTAGE OF GERD FINANCED BY GOVERNMENT :	37.4 %(1992)
PERCENTAGE OF GERD FINANCED BY INDUSTRY :	59.5 %(1992))
TOTAL GOVERNMENT BUDGET APPROPRIATIONS FOR R&D :	15 265 Mio ECU (1992)
DEFENCE R&D BUDGET AS A % OF TOTAL GOVERNMENT APPROPRIATIONS FOR R&D :	10.5 %(1992)
NUMBER OF SCIENTISTS AND ENGINEERS ENGAGED ON R&D PER 1000 LABOUR FORCE :	6 (1990)

RESPONSIBLE MINISTRY FOR S&T :
The Federal Ministry for Research and Technology (BMFT) and the corresponding Ministries in the Länder.

STRUCTURE of S&T POLICY :
The Federal and the Länder Governments attach importance to the freedom of research and the principles of "subsidiary funding". The Länder have (16.1 % of 1992 total R&D) mainly the responsibility for R & D in the universities; the Federal Government (22.1 % of 1992 total) is responsible for non-university R & D. The funding of the supporting bodies (DFG, MPG, FhG) and the national research centres is shared between the Federal and the Länder Governments. The Government believes that in a free-market economy the primary responsibility for R&D and innovation is that of industry (59.5 % of the 1992 total R & D funding). The general tax reform of 1990 should create attractive conditions for the industry. There are no tax incentives for R&D, at present.

NATIONAL PRIORITIES :
- the reconstitution and completion of the research system in the New Bundesländer,
- to assure the high level of basic research (20% of the total R&D expenditure),
- promotion of strategic technologies in the precompetitive field (in particular information technologies, miniaturisation of electronic and mechanical systems, biotechnology, research on advanced material, research for traffic, energy, and concentration on interdisciplinary research).
- improvement of the innovation capabilities of SMEs,
- continuation of preventive research (in particular ecology, health and social problems, space and polar research),
- strengthening of the international cooperation in RTD,
- continuation of the public long-term programmes (fusion and space research).

TRENDS : The business sector's contribution to global R&D expenditure decreased from 70.1 % in 1987 to 65.6 % in 1990 and 59.5% in 1992, but is still high among the EC Member States.

COMMENTS : For international cooperation in R&D about 1500 Mio ECU are spent abroad. German industry participates in 191 of 599 EUREKA projects (as of February 1993). Current discussions turn around the question whether Germany is an advantageous place for the industry and to what extent RTD policy can contribute to this situation. In this context a strategic circle with 14 high level personalities has been set up. Its particular task is the analysis of the efficiency of RTD and the application of the results (strengthening the interface Research-Industry). After the tax related measures (the R&D Investment Allowance and the Special R&D depreciation) have been phased out at the end of 1989, a new debate has started on the implementation of fiscal measures focusing in particular on SMEs.

20/09/1994

Data Sources : National Sources; OECD MSTI (1994-1) May 1994
REPORT AND OECD DATA BASES; EUROSTAT.

GREECE

GROSS DOMESTIC PRODUCT (GDP): ECU 63 780 million (1993)

GROSS domestic EXPENDITURE on R&D (GERD): ECU 267 million (1991)

GERD/GDP: 0.46% (1991)

R&D BUDGET/NATIONAL BUDGET: 0.57% (1992)

PERCENTAGE OF GERD FINANCED BY THE STATE: 58% (1991)

PERCENTAGE OF GERD FINANCED BY INDUSTRY: 22% (1991)

TOTAL GOVERNMENT R&D BUDGET: ECU 163 million (1992) (provisional)

DEFENCE R&D AS A % OF TOTAL GOVERNMENT APPROPRIATIONS: 1.5% (1992) (provisional)

NUMBER OF RESEARCHERS PER 1 000 LABOUR FORCE: 1.5 (1991)

MINISTRY RESPONSIBLE FOR S&T: General Secretariat for Research and Technology (GSRT), an autonomous body within the Ministry of Trade, Industry, Energy and Technology. The Ministry of Education is responsible for universities.

STRUCTURE OF S&T POLICY: Each ministry is responsible for the research within its field. The Ministry of Trade, Industry, Energy and Technology (GSRT) and the Ministry of Education provide 31.1% and 47.7% respectively of all state expenditure on R&D. The GSRT coordinates R&D efforts between the different ministries, research institutes, businesses, universities and international organizations.

NATIONAL PRIORITIES: These are based on the strategic elements of the RTD operational programme (EPET II) of the CSF for Greece (1994-99) and were consolidated by the new government formed after the elections of 10 October 1993. The aim is:

- to make Greek industry more competitive through RTD projects in sectors of major economic interest, enhance the development of industrial research, technology transfer and the innovation system;
- to improve and supplement research infrastructures, especially for strategic technologies and along geographical axes (north and south);
- to encourage technology training and S&T education;
- to create mechanisms for the development of programmes and technology and studies in support of policy choices.

TRENDS: GERD expressed as a percentage of GDP has been improving constantly, rising from 0.21% in 1981 to 0.46% in 1991. The goal is to reach 1% by the year 2000.

COMMENTS: Greece has become much more involved in EEC programmes in recent years.

Data sources: National sources; OECD MSTI (1994-1) May 1994 report and OECD data bases; Eurostat.

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SPAIN

GROSS DOMESTIC PRODUCT (GDP): ECU 439 542 million (1993)

GROSS domestic EXPENDITURE on R&D (GERD): ECU 3 719 million (1993)

GERD/GDP: 0.85% (1993)

R&D BUDGET/NATIONAL BUDGET: 2.38% (1990)

PERCENTAGE OF GERD FINANCED BY THE STATE: 45.7% (1991)

PERCENTAGE OF GERD FINANCED BY INDUSTRY: 48.1% (1991)

TOTAL GOVERNMENT R&D BUDGET: ECU 2 066 million (1993)

DEFENCE R&D AS A % OF TOTAL GOVERNMENT APPROPRIATIONS: 11.9% (1993)

NUMBER OF RESEARCHERS PER 1 000 LABOUR FORCE: 2.6 (1991)

MINISTRY RESPONSIBLE FOR S&T: The Interdepartmental Committee on Science and Technology (CICYT), made up of representatives of the 11 ministries involved in research, is the official body responsible for planning, coordinating and monitoring national S&T policy.

STRUCTURE OF S&T POLICY: The S&T activities of the 11 ministries involved in research are coordinated by the Interdepartmental Committee and are integrated into the national plan. Spain's autonomous regions have the option of adopting and implementing their own S&T policies. Efforts have been made to coordinate these activities at national level.

NATIONAL PRIORITIES: The National R&D Plan (1988-91) included two types of programme:

- national programmes (20 in all) with three priority areas: communication and production technologies (robotics, space research, microelectronics, new materials), natural resources and quality of life (biotechnology, pharmaceuticals sector, health, agriculture, forestry, aquaculture, etc.) and socio-cultural studies (conservation of historical heritage, socio-cultural studies on Latin America, etc.);

- horizontal and special programmes (training of research personnel, high-energy physics, Antarctica, etc.).

The second phase of the National R&D Plan (1992-95) has the same priorities, the main changes being in the concentration of programmes (15 instead of 25) and the introduction of a new type of project (integrated projects) in support of R&D activities involving several fields of technology.

COMMUNITY SUPPORT FRAMEWORK: The R&D activities in the second Community support framework (1994-99) aim at strengthening S&T infrastructure, technology transfer, training for researchers and R&D staff and support for technological innovation by companies. They will be implemented by means of regional and multiregional operational programmes.

TRENDS: In Spain, GERD expressed as a percentage of GDP rose from 0.4% in 1981 to 0.87% in 1991. In 1992 it fell to 0.86% and in 1993 to 0.85%. In absolute terms GERD rose by 20% between 1988 and 1989. This increase fell off sharply in 1991, when the average annual rate of growth was 5.3%, and in 1992, when it was -0.3%.
Nonetheless, the Spanish Government is determined to bring the national R&D effort up to a level comparable with that found in other advanced European countries, and in a balanced manner.

Data sources: National sources; OECD MSTI (1994-1) May 1994 report and OECD data bases; Eurostat.

21/9/1994

FRANCE

GROSS DOMESTIC PRODUCT (GDP): ECU 1 076 534 million (1993) (at current prices and exchange rates)

GROSS domestic EXPENDITURE on R&D (GERD): ECU 23 790 million (1992) (e)

GERD/GDP: 2.36% (1992)

R&D BUDGET/NATIONAL BUDGET: 5.99% (1990)

PERCENTAGE OF GERD FINANCED BY THE STATE: 49.8% (1991) (e)

PERCENTAGE OF GERD FINANCED BY INDUSTRY: 42.5% (1991)

TOTAL GOVERNMENT R&D BUDGET: ECU 14 634 million (1993) (provisional)

DEFENCE R&D AS A % OF TOTAL GOVERNMENT APPROPRIATIONS: 36.3% (1993)

NUMBER OF RESEARCHERS PER 1 000 LABOUR FORCE: 5.2 (1991)

MINISTRY RESPONSIBLE FOR S&T: The Ministry of Higher Education and Research (MESR), set up in April 1993, is responsible f in France.

STRUCTURE OF S&T POLICY: In parallel or in cooperation with the MESR, other ministerial departments also play an import stimulation of scientific and technical activities; these include the Ministry of Industry, the Ministry of Posts and Telecommunication of Foreign Trade, the Ministry of Education and the Ministry of Defence. Research is evaluated mainly by the National Counc Evaluation (CNER). The Science and Technology Council (CSRT) is a body for broadbased consultations and dialogue on S&T policy. Committee to be set up in November 1994 will strengthen S&T strategy-making. The Science and Technology Observatory (OST), produces and disseminates indicators describing French S&T activity in its regional, national and international context.

NATIONAL PRIORITIES: The 1995 civil R&D budget has the following priorities:

- medical and biological research;
- civil aviation;
- scientific employment and training through research.

Other priorities include research into

- agriculture and food;
- the environment;
- urban planning;
- transport;
- meteorology.

Great importance is still attached to international S&T cooperation, especially with the East. France remains a major contributor to technological programmes and to the European Space Agency.

TRENDS: Over the last 12 years R&D expenditure as a percentage of GDP has risen from 2.01% (1981) to 2.36% (1992) with an growth rate of 4.3% between 1981 and 1991. However, 1990 saw a stabilization after almost a decade of growth. The increase in the budget was 3.5%, which is significantly less than the increases of 1981-90.

COMMENTS: A policy report on the national consultations on the major objectives of French research launched in September submitted to Parliament in June 1994. The main aim of these consultations was to determine the broad thrus in the years ahead, consider the career patterns and mobility of researchers and teachers and determine the ro of research bodies.
Alongside this national consultation, the MESR launched a survey of technology prospects to assess the technical could constitute the basis of future technological developments.

Data sources: National sources; OECD MTSI (1994-1) May 1994 report and OECD data bases; Eurostat.
(e) Estimate.

27/9/1994

IRELAND

GROSS DOMESTIC PRODUCT (GDP)	37 733 Mio ECU (1993)
GROSS DOMESTIC EXPENDITURE FOR R&D (GERD)	413 Mio ECU (1992)
GERD/GDP	1.1 % (1992)
GOVERNMENT BUDGET APPROPRIATIONS FOR R&D AS A % OF CENTRAL GOVERNMENT BUDGET	1.08 % (1990)
PERCENTAGE OF GERD FINANCED BY GOVERNMENT	23 % (1992)
PERCENTAGE OF GERD FINANCED BY INDUSTRY	65 % (1992)
GOVERNMENT APPROPRIATIONS BUDGET FOR R&D	170 Mio ECU (1993)
DEFENCE R&D BUDGET AS A % OF TOTAL GOVERNMENT APPROPRIATIONS FOR R&D	0 % (1994)
NUMBER OF SCIENTISTS AND ENGINEERS ENGAGED ON R&D PER 100 LABOUR FORCE	4.1 % (1991)

RESPONSIBLE MINISTRY FOR S&T : The Office of Science and Technology within the Department of Employment and Enterprise (DEE) is responsible for coordinating S&T issues across Government.

STRUCTURE AND IMPLEMENTATION OF S&T POLICY : The agency structure responsible for disbursing funding for S&T to industry and academe has recently been reorganized as a result of the Culliton report on industrial policy. FORBAIRT replaces EOLAS as the principal funding agency although some research (such as biomedical research) is still funded through the ministry concerned. FORBAIRT although much closer to industry than academe administers research grants (circa £ 1.2 M for 1994) and funds applied research through the Programmes on Advanced Technology (PATs, circa £ 11 M for 1994 of which approximate 75% comes from EU Structural Funds).

S&T policy is currently being reviewed by a recently inaugurated Science Technology and Innovation Council which is due to report by the end of 1994. This Council , set up partly in response to an outcry from the research community following a funding moritorium in 1993, will consider inter alia research funding levels, the balance between basic and applied research, in preparation for a S&T White Paper. The European Commission has been invited to comment on this exercise and provide insight into areas such as the balance between basic and applied research and the process of priority setting.

NATIONAL PRIORITIES : Will be revised in the light of the forthcoming White Paper but currently include PATs on biotechnology, materials, optoelectronics, advanced manufacturing, and polymers.

TRENDS : The trends for 1993 were distinctly away from basic research towards applied research and development although overall budgets for RDT were depressed. The current signs are for a slight reversal of these trends. The mechanisms for coordinating S&T policy are also under review and responsibility for the Office of Science and Technology might be transferred from the (industry based) DEE to the Department of the Taoiseach (cabinet office)

21/09/1994

Data Sources : National Sources; OECD MSTI (1994-1) May 1994
REPORT AND OECD DATA BASES; EUROSTAT

ITALY

GROSS DOMESTIC PRODUCT (GDP):	814 065 Mio ECU (1993)
GROSS DOMESTIC EXPENDITURE FOR R&D (GERD):	11 402 Mio ECU (1993)
GERD/GDP:	1.40 % (1993)
GOVERNMENT BUDGET APPROPRIATIONS FOR R&D AS A % OF CENTRAL GOVERNEMENT BUDGET :	1.39 % (1993)
PERCENTAGE OF GERD FINANCED BY GOVERNMENT :	48.3 % (1993)
PERCENTAGE OF GERD FINANCED BY INDUSTRY:	46.6 % (1993)
TOTAL GOVERNMENT APPROPRIATIONS FOR R&D :	6 422 Mio ECU (1993)
DEFENCE R&D AS A % OF TOTAL GOVERNMENT APPROPRIATIONS FOR R&D :	6.50 % (1993)
NUMBER OF SCIENTISTS & ENGINEERS ENGAGED ON R&D PER 1000 LABOUR FORCE :	3.1 (1991)

RESPONSIBLE MINISTRY FOR S&T: Ministry of Universities and Scientific and Technological Research (MURST)

STRUCTURE OF S&T POLICY: MURST defines priorities, oversees the University system as a whole, supervises the public research establishments and manages some of the instruments for directing and supporting industrial research

NATIONAL PRIORITIES: Between 1990 and 1993 government R&D funding was shifted from technological objectives (from 33 to 28 per cent of total) to university research (from 30 to 38 per cent).

The main fields which have been financed in the last years (public and private sector) are:
- electronics
- transport (spacecraft)
- telecommunications
- chemistry
- physics
- environment
- biotechnology
- biomedicine
- bioinstruments

TRENDS: GERD in 1993 has not changed substantially. The R&D expenditure in the public sector has been 42.9%; it includes public research establishment, public administrations and universities. Financial support is increasing for: *SME* (enterprises with less than 200 employes and less than 20 billion liras of invested capital), *consortia* which perform various activities and to *Science and Technological Parks*, all over the Country. More emphasis has been given to *applied research.*

COMMENTS: It is particularly urgent to reduce the gap between Northern and Southern Italy. Since many public funds have been reduced or cut to Southern, the private sector, expecially of SME, must be pushed to invest in R&D.

21/09/94

Data Sources : National Sources; OECD MSTI (1994-1) May 1994
REPORT AND OECD DATA BASES; EUROSTAT.

LUXEMBOURG

GROSS DOMESTIC PRODUCT (GDP): ECU 6.910 million (1990) (at current prices and exchange rates) (e)

GROSS domestic EXPENDITURE on R&D (GERD): ECU 141 million (1990) (e) (1)

GERD/GDP: 2.04% (1990) (e) (1)

R&D BUDGET/NATIONAL BUDGET: Not available.

PERCENTAGE OF GERD FINANCED BY THE STATE: Not available.

PERCENTAGE OF GERD FINANCED BY INDUSTRY: 94.6% (1990) (e) (1)

TOTAL GOVERNMENT R&D BUDGET: ECU 7.5 million (1990) (e) (1)

DEFENCE R&D AS A % OF TOTAL GOVERNMENT APPROPRIATIONS: Not available.

NUMBER OF RESEARCHERS PER 1 000 LABOUR FORCE: 4.3 (1990) (e) (1)

MINISTRY RESPONSIBLE FOR S&T: Ministry of Education.

STRUCTURE OF S&T POLICY: Interdepartmental Committee on the coordination of scientific research and technological development.

NATIONAL PRIORITIES:

There are two main objectives:
- to create an environment favourable to innovative research initiatives by businesses;
- to encourage more particularly the innovative effort of small businesses by creating centres of competence in areas where Luxembourg is on a par with other countries.

These objectives will be attained *inter alia* by:
- the creation of Public Research Centres (CRP), which will carry out R&D activities with partial state funding;
- the introduction of a system of aid for R&D carried out in businesses;
- the transfer of research results from the CRPs to businesses.

TRENDS: Overall R&D expenditure as a percentage of GDP is above the EUR12 average, i.e. around 2.04% in 1990. Budget allocations for R&D, though modest (ECU 7.5 million in 1990) in relation to GERD, are continuing to rise.

COMMENTS: Two businesses in the chemicals-related and steel sectors account for almost 86% of R&D expenditure in Luxembourg. Outside these two sectors, 6% of R&D expenditure is accounted for by the metal processing sector. Following the law of March 1987, three CRPs are already operational. The Luxembourg authorities have now started gathering regular data on R&D activities in the Grand Duchy.

(e) Estimate.
(1) Source: EC study on R&D potential in the Grand Duchy.

29/9/1994

THE NETHERLANDS

GROSS DOMESTIC PRODUCT (GDP) :	262 740 Mio ECU (1993) (at current prices and exchange rates)
GROSS DOMESTIC EXPENDITURE FOR R&D (GERD) :	4 475 Mio ECU (1991)
GERD/GDP :	1.92 % (1991) [1.96% (1992)(1)]
GOVERNMENT BUDGET APPROPRIATIONS FOR R&D AS A % OF CENTRAL GOVERNMENT BUDGET :	2.7 % (1990)
PERCENTAGE OF GERD FINANCED BY GOVERNMENT :	44.9 % (1991)
PERCENTAGE OF GERD FINANCED BY INDUSTRY :	51.2 % (1991)
TOTAL GOVERNMENT BUDGET APPROPRIATIONS FOR R&D :	2 173 Mio ECU (1994)
DEFENCE R&D BUDGET AS A % OF TOTAL GOVERNMENT APPROPRIATIONS FOR R&D :	3.4 % (1994)
NUMBER OF SCIENTISTS AND ENGINEERS ENGAGED ON R&D PER 1000 LABOUR FORCE :	3.8 (1991)

RESPONSIBLE MINISTRY FOR S&T : The Ministry of Education and Science and the Ministry of Economic Affairs.

STRUCTURE of S&T POLICY : Decision making is based on a broadly structured network of advisory bodies. S & T Policy is prepared by the Council for Science and Technology Policy (AWT), chaired by the Prime Minister within which the Minister of Education and Science acts as coordinating minister for science policy and the Minister of Economic Affairs as coordinating minister for technology. The public R&D funds are administered by the Ministry of Education and Science (55 %), the Ministry of Economic Affairs (19 %), and the other Ministries (26 %). In the business sector the five multinationals funded roughly 80% of the research (as of 1990).

NATIONAL PRIORITIES : Amongst the development of new knowledge, its dissemination through a network of 18 regional innovation centres mainly to SMEs is still a top issue. Increasing importance is given to vocational education, as the availability of well-trained staff is considered as crucial particularly in the international context. The interaction between technology and the social environment has recently become a new pillar in S/T policy.

The industrial oriented technology programmes to support medium-term economic growth concentrate on : materials technology, biotechnology and information technology. Long-term strategic research will concentrate on multidisciplinary research, environmental research and energy research and will be backed up with intensive foresight studies and under the consideration of ongoing internationalisation in S/T.

TRENDS : The GERD as percentage of GDP strongly increased in the 1984-87 catch-up period but has slightly been decreasing over the last few years. This could be explained by a stagnation of R&D in the public sector. The business sector decreased its contribution to GERD from 55.9 % in 1990 to 51.2 % in 1991.

COMMENTS : The "Internationalisation of Education and Research" is a major issue in the Dutch S&T policy. Major projects in the international context are the EUREKA projects JESSI and COSINE.

20/09/1994

Data Sources : National Sources; OECD MSTI (1994-1) May 1994
REPORT AND OECD DATA BASES, EUROSTAT.

(1) Wetenschapsbudget 1993

PORTUGAL

GROSS DOMESTIC PRODUCT (GDP): ECU 66.956 million (1993)

GROSS domestic EXPENDITURE on R&D (GERD): ECU 288 million (1990)

GERD/GDP: 0.61% (1990)

R&D BUDGET/NATIONAL BUDGET: 1.15% (1990)

PERCENTAGE OF GERD FINANCED BY THE STATE : 61.8% (1990)

PERCENTAGE OF GERD FINANCED BY INDUSTRY: 27% (1990)

TOTAL GOVERNMENT R&D BUDGET: ECU 327 million (1993)

DEFENCE R&D AS A % OF TOTAL GOVERNMENT APPROPRIATIONS: 0.4% (1993)

NUMBER OF RESEARCHERS PER 1 000 LABOUR FORCE: 1.2 (1990)

STRUCTURE OF S&T POLICY: Since 1986 and particularly since the establishment of the Science and Technology Council there have been important changes in Portugal's system of science and technology. The JNICT is the main body responsible for planning, policy and overall coordination, and also has to prepare the R&D budget (see directory).

NATIONAL PRIORITIES: The sectoral guidelines for the medium term set out in the Multiannual Plan of Scientific Research and Technological Development for the 1990s are as follows:

- stepping up national participation in international research in basic areas of science (including the exact sciences, biology and biomedicine);
- developing Portugal's capacity to participate selectively in European programmes concerning the new information and telecommunications technologies;
- developing national R&D capacity in technologies (energy production, new materials, biotechnology, etc.) which can help modernize traditional industrial sectors;
- stepping up national research capacity in earth, marine and tropical sciences;
- guiding the development of social and human sciences.

PARTICIPATION IN COMMUNITY RTD ACTIVITIES: Portugal's participation is modest; since 1987 Portugal has participated in 728 projects, mainly in the following areas:

- modernization of industrial sectors
- human capital
- non-nuclear energy
- agro-industry and biotechnology
- marine sciences.

COMMUNITY SUPPORT FRAMEWORK: The R&D activities proposed under the Community Support Framework (1994-99) took account of national strategic guidelines, aiming to enhance the infrastructure for research and technological development, to train researchers and to promote the technological capacity of businesses. PRAXIS (ECU 376 million from EC), devoted entirely to strengthening Portugal's science and technology system, and PEDIP II to modernize Portuguese industry (ECU 220 million for RTD from EC) are the most important operational programmes in this sector.

TRENDS: R&D expenditure has risen consistently in recent years, the aim being that the figure should shortly reach 1% of GDP. The main players in the S&T system have become the universities and the non-profit-making private associations, which have benefited greatly from the Structural Funds.

Data Sources: National sources; OECD MSTI (1994-1) May 1994 report and OECD data bases; Eurostat.

21/9/1994

UNITED KINGDOM

GROSS DOMESTIC PRODUCT (GDP)	773 000 Mio ECU (1993)
GROSS DOMESTIC EXPENDITURE FOR R&D (GERD)	17 800 Mio ECU (1992)
GERD/GDP	2.12 % (1992)
GOVERNMENT BUDGET APPROPRIATIONS FOR R&D AS A % OF CENTRAL GOVERNMENT BUDGET	3.01 % (1990)
PERCENTAGE OF GERD FINANCED BY GOVERNMENT	35.4 % (1992)
PERCENTAGE OF GERD FINANCED BY INDUSTRY	49.7 % (1992)
TOTAL GOVERNMENT BUDGET APPROPRIATIONS FOR R&D	6 803 Mio ECU (1993)
DEFENCE R&D BUDGET AS A % OF TOTAL GOVERNMENT APPROPRIATIONS FOR R&D	45 % (1993)
NUMBER OF SCIENTISTS AND ENGINEERS ENGAGED ON R&D PER 1000 LABOUR FORCE	4.5 (1991)

RESPONSIBLE MINISTRY FOR S&T : The Office of Science and Technology (OST), under direct Cabinet Minister control, coordinates S&T issues across Government and has responsibility for the six Research Councils. Other key Government bodies are : the Department of Trade and Industry (DTI), the Department of Education (DFE), the Ministry of Defence (MOD) and the Ministry for Agriculture, Food and Fisheries (MAFF).

STRUCTURE AND IMPLEMENTATION OF S&T POLICY : Higher education institute (HEI) funding is channelled primarily through the Research Councils. Separate funding related to HEI performance is provided by the DFE's Higher Education Funding Councils. A new Research Council structure came into being on 1st April 1994 with stronger links to Central Government (via an OST based Director General) and with greater emphasis on wealth creation. Other Government Department Laboratories (e.g. those of DTI, MOD, MAFF, ...), and the scientific institutions of the Research Councils themselves, are currently being scrutinized with a view to possible privatisation or "rationalisation". S&T support to industry, especially SMEs, through the DTI now concentrates on technology transfer, consultancies, standards, awareness, best practice, and has moved away from supporting the generation of technology.

NATIONAL PRIORITIES : Following the publication of the White Paper a Technology Foresight Programme was launched to identify priority market/technology sectors of most relevance to (industrial) users and to assist the formulation of Government S&T policy. 15 broad areas have been identified for further analysis : agriculture natural resources and environment, chemicals, communications, construction, defence and aerospace, energy, financial services, food and drink, health and life sciences, information technologies and electronics, leisure and education, materials, manufacturing production and business processes, retail and distribution, and transport.

TRENDS : Government R&D expenditure is forecast to fall progressively in real terms from 6 800 Mio ECU (FY92/93) to 6 020 Mio ECU (FY95/96; 1993 prices and exchange rates). Both civil and defence budgets R&D (current estimates for 93-94 : 3 620 Mio ECU and 2 980 Mio ECU respectively) are in decline. Within the civil R&D budget, cuts in civil department expenditure and higher education infrastructure expenditure will not be fully compensated for by a projected increase in Research Council spent for basic (though economically relevant) science.

21/09/1994

Data Sources : National Sources; OECD MSTI (1994-1) May 1994
REPORT AND OECD DATA BASES; EUROSTAT