

ECONOMIC AND SOCIAL COMMITTEE
OF THE EUROPEAN COMMUNITIES

**ORGANIZATION AND MANAGEMENT
OF
COMMUNITY RESEARCH AND DEVELOPMENT**

STUDY

Brussels, February 1980

This publication is also available in Danish, Dutch, French, German and Italian

A bibliographical slip can be found at the end of this volume

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PREFACE

On 23 February 1978, the Bureau of the Economic and Social Committee authorized its Section for Energy and Nuclear Questions, which is also responsible for research policy, to prepare a Study on:

The Organization and Management of Community R & D

The Economic and Social Committee has, for some considerable time now, been acutely conscious of the challenge facing the Community and the world in relation to problems such as population, food, energy and raw materials, the nature and size of economic growth, as well as the interrelationship between these problems. The Committee's concern has been expressed in many of its Opinions and Studies in recent years.

It is also aware that science and technology policy in the broadest sense, and research and development activity in particular, are among the most powerful potential instruments in influencing the course of future developments. This was stressed by the Committee in a major own-initiative Study in 1976 (13). On that occasion, the Committee not only called for a Common Community Policy on Research and Development but also outlined the objectives and priorities for it. As the recommendations made on that occasion are still valid, it is not intended to re-examine them in the present Study (1).

At the same time, it is clear that if the Community is to run an effective R & D Policy, it must have the institutional machinery which allows it to do so. If this machinery is not used in an efficient manner, then it is unlikely that the Community will be entrusted with a worthwhile role in the longer term.

The present Study therefore sets out to examine the decision-making and management procedures which are currently used for Community-sponsored research and development activity and, where possible, to suggest improvements to these procedures.

As a first step, it was decided to prepare a summary of the R & D decision-making and management procedures in the Member States so as to be in a better position to review those which are used at Community level. These national summaries are contained in PART II. They were prepared solely for the

purposes of the present Study (i.e. to identify possible procedures which might usefully be taken into account in the Community's system). They do not provide a definitive description of the national systems. Particular attention is given to advisory bodies which help to relate science and technology policy to economic and social objectives. The summaries are not intended as a comparative analysis of national R & D structures (1). For a detailed analysis, reference should be made to the sources listed in the bibliography. And they do not make recommendations on the arrangements within the Member States.

The Study covers research and development activity sponsored by the Community. Insofar as the Study refers by extension to national R & D, it relates exclusively to research funded by *public authorities*. It does not cover the equally substantial private R & D effort funded by industry and other non-Government bodies. While this R & D work is of at least equal importance for the Community's future development, and should be given all possible encouragement by Community authorities, responsibility for management lies primarily with the sponsors of the work themselves.

Within the public sector, a further distinction between "basic research" and "applied research" is needed. "Basic research" is undertaken "without any particular application or use in view". "Applied research", on the other hand, is "directed primarily towards a specific practical aim or objective" (15). Much of Government-funded "basic research" is carried out by academic bodies. In the statistics in the Study, it largely appears under the heading "General Promotion of Knowledge". Again, while this work is undoubtedly a vital part of the total research and development effort and often prepares the way for projects of an applied nature, "basic research" is primarily concerned with widening the frontiers of human knowledge. Public authorities have a major role in promoting it. But they do not, in principle, seek to influence its direction. For this reason, and because the R & D sponsored by the Community is very largely in the "applied research" category, the Study seeks to confine itself, as far as possible, to "*applied research*".

The Study describes the institutional framework, as of 1 January 1979 for R & D sponsored by the Community and the Member States.

(1) It is also likely that the Economic and Social Committee will be called upon to give an Opinion on a forthcoming Commission Communication on the Common Policy in the field of Science and Technology.

(1) Work in this field is carried out by the Community under the auspices of CREST. See the work of the Confrontation Meeting of National and Community R & D Policies (COPOL 79).

On the basis of this examination, and on the basis of individual reports drawn up for each Member State, comments and recommendations were drawn up in the first instance by the "Study Group on R & D Policy" with the following membership:

Chairman: Mr van GREUNSVEN
Rapporteur: Mr RENAUD
Members: Mr BONETY
 Mrs CLARK
 Mr COUTURE
 Mr von der DECKEN
 Mr FRIEDRICHS

Mr MILLS
 Mr NIELSEN P.
 Mr ROMOLI
 Mr ZOLI
Expert: Mr BROUWERS

The Section for Energy and Nuclear Questions approved the Study at meetings on 30 November 1979 and 11 January 1980.

The Study was adopted unanimously by the Economic and Social Committee at its Plenary Session held on 31 January 1980.

PART I

STUDY
of the Economic and Social Committee
on
the Organization and Management of
Community Research and Development

I. INTRODUCTION

The Governments of the Member States and the Community are estimated to have spent, on aggregate, 14.7 billion EUA on research and development in 1978(10). The Community only finances a small proportion (about 1.6% of the total) out of its own budget. In practice, however, the Community's various coordination activities seek to influence a much larger proportion of the total public R & D effort.

The Community's R & D activities have altered substantially since the signing of the Treaties. These provided for:

- i) "technical and economic research relating to the production and increased use of *coal and steel* and to occupational safety in the coal and steel industry" (Article 55, *ECSC Treaty*);
- ii) "coordination of efforts in the spheres of vocational training, of research and of dissemination of *agricultural knowledge*" (Article 41, *EEC Treaty*);
- iii) "Community research and training programmes" (Article 7) and the establishment of a "Joint Nuclear Research Centre" (Article 8, *EURATOM Treaty*).

Initially, the bulk of Community R & D work related to the nuclear field under the EURATOM Treaty. However, after the mainstay of the nuclear programme, the ORGEL reactor project, was abandoned in 1968, it became necessary to look for new activities for the research establishments of the Joint Research Centre (JRC) which the Community had created for the purpose. This led to some diversification of the JRC into non-nuclear activities in the early 1970's. Moreover, following the Paris and Copenhagen summits, the Council, acting on a proposal from the Commission, adopted a number of Resolutions on 14 January 1974 ⁽¹⁾ on the implementation of a common policy in the field of science and technology, and in particular a first programme of R & D projects in support of the Community's sectoral policies and designed to meet its overall socio-economic needs. There was also the 1974 agreement between Member States, interpreting Article 235 of the EEC Treaty in such a way as to make it applicable to all technological research projects in non-nuclear fields. Since then,

there has been a rapid increase in the number and diversity of Community R & D projects outside the nuclear field.

The pattern of Community financing of R & D is different from that of the Member States. There is, of course, no research on Defence. Energy accounts for the bulk of expenditure (65%). The proportions spent on Health (16%) and Industry (13%) are also higher than the average for the Member States. Agriculture, Social and Sociological Problems and Earth Exploration each account for between 1% and 2%. SCHEDULE I provides a breakdown by major objective of Community-funded R & D in 1978.

In addition to its work of general coordination, Community R & D activity broadly takes the following forms:

- *Direct Actions*, which are carried out "intramurally" by the Commission through its Joint Research Centre (JRC);
- *Indirect Actions*, which refer to projects contracted out to research establishments in the Member States, with the Community generally contributing a maximum of 50% of the cost,
- *Concerted Actions*. Work is carried out by Member States at their own expense, with the Community bearing the cost of coordinating it;
- *Demonstration Projects*, which must be classified as "development" rather than "research", being designed to encourage the final stage of translating new technology into everyday use. Like the Indirect Research Actions, the work is contracted out to interested bodies and undertakings in the Member States, with the Community generally contributing a maximum of 50% of the cost.

Cooperation on science and technology between the Member States of the Community and some other European countries is provided for, to some extent, in sectoral agreements under COST programmes; the European Community provides secretarial services; participation by individual countries in each specific programme is optional.

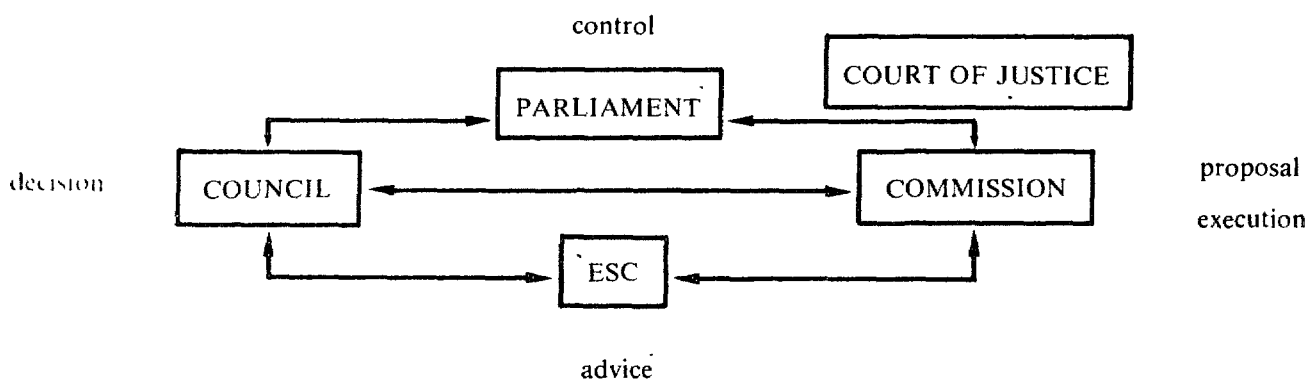
A list of the individual Community programmes, operational and planned, under the different types of action is given in SCHEDULE II.

⁽¹⁾ O.J. No. C 7 of 29 January 1974

II. THE INSTITUTIONAL FRAMEWORK

The basic pattern of decision-making and management of Community R & D is the same as for Community policy in general, i.e.:

ILLUSTRATION I



However, a large number of bodies, many of which were not foreseen when the Treaties were adopted, have been progressively added to the system. ILLUSTRATION II gives a more detailed description of the different bodies currently involved in Community R & D decision-making and management.

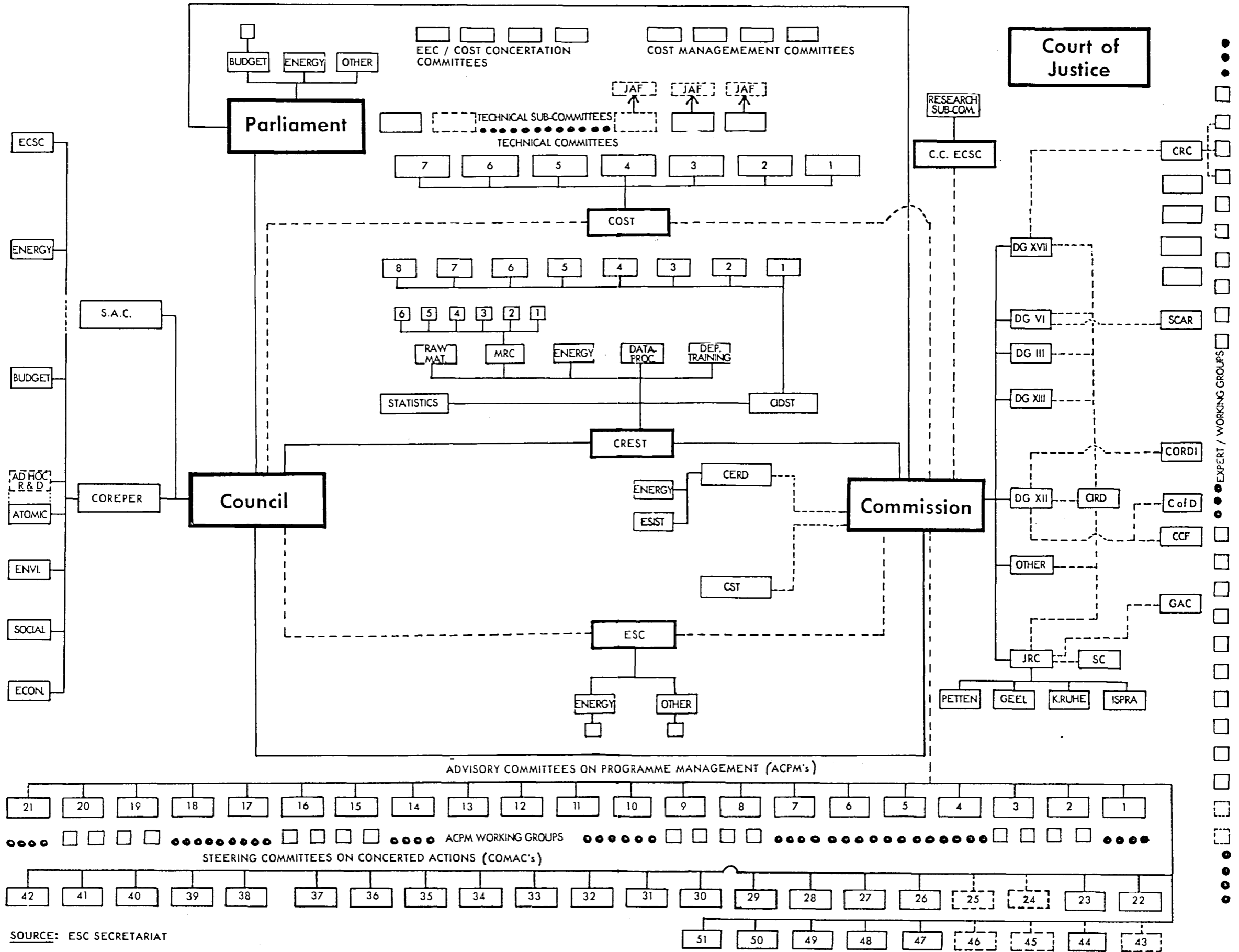
These bodies are mostly constituted as advisory committees to the Commission and/or the Council at the preparatory, decision-making and execution stages. Their composition, official terms of reference and de facto roles in the present-day system vary considerably. They do not fit into a clearcut conceptual model. But

for explanatory purposes, a large number of them can be placed in the following broad categories:

- The CREST group;
- The ACPM/COMAC group;
- other bodies near the Commission;
- the COST group.

The role of these bodies and how they relate to the main institutions (Commission, Council, Parliament, Economic and Social Committee) is briefly described in the following sections.

ILLUSTRATION II - THE ORGANISATION OF COMMUNITY INVOLVEMENT IN R & D



SOURCE: ESC SECRETARIAT

III. THE COUNCIL

With the exception of special provisions on research stemming from the ECSC Treaty, the decision-making procedures of the Council of Ministers in the R & D field were originally primarily designed to deal with atomic research under the EURATOM Treaty. The preparatory nuclear work is carried out by the *Atomic Questions Group*. The draft then goes to the *Committee of Permanent Representatives* (COREPER) before being finally submitted for adoption by the Council of Ministers.

As far as the other, non-nuclear fields are concerned, the diversification of Community research had some repercussions on the institutional arrangements. On 14 January 1974, the Council set up a Scientific and Technical Research Committee (CREST) composed of representatives of the Governments of the Member States (see section IV). It was intended that CREST should, inter alia, carry out much of the preliminary work of negotiation within the Council. CREST was not excluded from any policy area except subjects covered by military or industrial secrecy. But in practice its main activities have been in the non-nuclear field.

The original procedures for nuclear research have remained intact, with the Atomic Questions Group carrying out the preparatory work. In the non-nuclear field, the initial work is carried out by CREST. COREPER has recourse to an *Ad Hoc Research Group* to complete preparations. The Ad Hoc Research Group is an informal working party which parallels the Atomic Questions Group and has basically the same membership.

Most R & D projects are dealt with in this way, with two exceptions. Coal research, which is governed by special provisions of the ECSC Treaty, is considered by the *ECSC Group*. Agricultural R & D policy, like other agricultural matters, goes through the machinery of the *Special Agricultural Committee*.

The *Budget Group* has an overall brief on the financial aspects of all Acts of the Council including those relating to R & D.

IV. THE SCIENTIFIC AND TECHNICAL RESEARCH COMMITTEE (CREST)

CREST was set up following a Council Resolution of 14 January 1974. It succeeded the PREST Group, a body under the Committee on Medium-Term Economic Policy. It was intended that CREST should be the central body concerned with helping the Commission and the Council to formulate Community R & D policy. Its main role is to assist in:

- the coordination of national and Community policies, both on sectoral and general levels.
- the definition and execution of projects of Community interest.

CREST is composed of senior Government officials responsible for science policy under the chairmanship of a representative of the Commission ⁽¹⁾. Each Member State has two full members and two proxy members. By giving prior notice to the Committee, the Member States can also bring advisors from non-Government circles to help with specific points on the agenda.

CREST was constituted as an advisory body to both the Commission and the Council, which it provides with its views on all scientific, technical, administrative and financial aspects of Commission proposals in the area of science and technology. CREST discusses draft proposals before they are formally adopted by the Commission. Once the proposals reach the Council, CREST considers them once again, this time acting as a preparatory working group on the adoption of the

programme by the Council. The idea behind this dual role was to improve the decision-making system, to associate the senior R & D officials of the Member States and to ensure that proposals put forward by the Commission already closely reflected the collective views of the representatives of the Member States, thus speeding up their adoption.

In carrying out its work, CREST is assisted by a number of sub-bodies. It has two general permanent sub-committees:

- *R & D Statistics Sub-Committee* which was set up on 9 July 1969 to gather data on Government expenditure on R & D in each of the Member States so as to allow comparison of their respective research budgets;
- *Committee for Scientific and Technical Information and Documentation (CIDST)* which was established on 24 June 1971 to assist the Commission, and what is now CREST, in drawing up projects in the field of scientific and technical information and documentation. CIDST has 8 permanent specialized working groups:
 - 1) Economic and Technical Aspects of EURONET's development;
 - 2) Agricultural Information;
 - 3) Biomedical Information;
 - 4) Information on the Protection of the Environment;
 - 5) Energy Documentation;

⁽¹⁾ Since its establishment in 1974, CREST has been chaired by the Director-General of DG XII (Research, Science and Education) of the Commission.

- 5) Relations with Users (task force);
- 7) Legal Aspects (ad hoc groups);
- 3) Multilingual Problems.

Some of these CIDST working groups also have a number of sub-bodies under them. The duties and method of operation of CIDST were redefined in the Council decision of 9 October 1978 adopting a second three-year plan of action in the field of scientific and technical information and documentation.⁽¹⁾

In addition, CREST has 5 specialized permanent sub-committees:

- *Energy R & D sub-Committee* which was set up in 1975. It advises CREST on the coordination of national energy R & D policies and in the identification of actions of Community interest designed to further common energy policy objectives;

- *Data-processing R & D sub-Committee* which was also established in 1975. It makes suggestions to CREST on possible actions designed to increase the efficiency of R & D in the data-processing sector;
- *Sub-Committee on Training in Data-processing*. Its role is to organize training courses in the Member States;
- *Committee on Medical Research and Public Health (CRM)* which was set up in 1972 to compare national R & D programmes and to identify issues which could be studied in common. The CRM currently has 3 specialized working groups:
 - 1) Epidemiology
 - 2) Biomedicine
 - 3) Bioengineering
- *Raw Materials R & D Sub-Committee* which was set up in 1978. It also advises CREST on the coordination of national policies and the identification of actions of Community interest designed to further common objectives.

V. THE COMMISSION

The Commission has a number of Directorates-General which are concerned with research and development and science and technology.

DG XII (*Research, Science and Education*) has overall responsibility for Community R & D Policy. It is responsible for the implementation of this policy and in particular for the framing, preparation and administration of most scientific R & D programmes, apart from "direct" action which is dealt with by the JRC. The Director-General chairs CREST and DG XII provides scientific back-up for the Council secretariat, not only in connection with CREST but also in connection with COST (see section VIII). In conjunction with other Directorates-General it provides secretarial services for the ACPM's.

DG XIII (*Scientific and Technical Information and Information Management*) is a more specialized Directorate-General located in Luxembourg. It covers technological transfers and industrial property questions as well as the management of scientific and technical information and documentation (IDST). It has specific responsibility for the Community IDST system (EURONET). The Directorate-General services the CIDST branch of committees within the CREST structure

The *Joint Research Centre (JRC)* was set up in 1958 on the basis of Art. 8 of the EURATOM Treaty "to ensure that the research programmes and other tasks assigned to it by the Commission are carried out". It is constituted as a Directorate-General, and forms an integral part of the services of the Commission. It was originally intended that the JRC should carry out a research and training programme which would supplement the nuclear research of the Member States. However, by 1962, it had become clear that it was no longer politically possible to pursue a nuclear research

programme under the terms of the Treaty. The JRC subsequently underwent a period of uncertainty as to its role, being financed on a year-to-year basis. By joint agreement of the Commission and the Council the JRC was reorganized in 1971. The result of this reorganization has been to enable the JRC to retain a certain amount of management autonomy. Its activities were extended to areas outside the nuclear field (environmental, other energies, etc.). The JRC carries out the "direct" Community R & D actions, in the form of multiannual programmes. The current programme which runs from 1 January 1977 to 31 December 1980 has ten actions (see SCHEDULE II.1). The JRC has 4 establishments:

<i>Establishment</i>	<i>Staff (approx.)</i>
Ispira (Italy)	1,700
Karlsruhe (Germany)	210
Geel (Belgium)	200
Petten (Netherlands)	160

The Director-General of the JRC and a small headquarters' staff are located in Brussels.

A number of other Directorates-General have certain specific responsibilities for R & D activities in their own sector, e.g.

DG III	Industrial and Technological Affairs	Steel, Data-processing, R & D Aeronautics, Footwear, Textiles, Ceramics
DG V	Employment and Social Affairs	Social R & D, Health and Safety at Work
DG VI	Agriculture	Agricultural R & D
DG XVII	Energy	Coal Research (Art. 55 of ECSC Treaty) Energy Demonstration projects

⁽¹⁾ O.J. No. L 311 of 4 November 1978 page 5

VI. ADVISORY COMMITTEES ON PROGRAMME MANAGEMENT (ACPM's) AND STEERING COMMITTEES ON CONCERTED ACTIONS (COMAC's)

The Advisory Committees on Programme Management (ACPM's) were set up by various Council Resolutions between 1969 and 1975. Their terms of reference were consolidated in a Council Resolution of 18 July 1977⁽¹⁾. As a rule, there is an ACPM for each area covered by research programmes adopted by the Community. The task of each ACPM is to

"contribute in its advisory capacity, to the best possible implementation of the programme for which it is responsible (in particular the detailed definition of projects) and to assess the results and to ensure better liaison between the implementation of programmes at Community level and the corresponding research and development work being carried out in the Member States".

Each ACPM consists of not more than:

- Three experts appointed by applying whatever criteria it deems appropriate, by each of the Governments of the Member States taking part in the programme under consideration (Member States' Delegations).
- three officials appointed by the Commission (Commission Delegation);

ACPM's appoint their Chairmen on a proposal from the Commission Delegation. Secretarial services are provided by Commission officials who are placed for this purpose at the disposal of the Committee under the authority of its Chairman. Each Committee meets in principle three times a year

There are 7 ACPM's which deal exclusively with "direct" Community R & D actions (i.e. work of the JRC). A further 6 cover both a "direct" and an "indirect" action programme in a particular field. The remainder deal exclusively with "indirect" actions (i.e. work contracted out to research establishments in the Member States). In the case of "concerted actions" (where the Community simply provides coordinating services), there are analogous Committees which are known as "Committees on Concerted Actions" (COMAC's). A list of the existing and proposed ACPM's and COMAC's, of which there are a total of 51, is given in SCHEDULE II. Many of these are the result of recent proposals.

The Commission has examined ways in which the number of ACPM's might be contained. A note prepared within the Commission was sent to CREST on 13 November 1978 (11). It contained suggestions to combine the membership of different ACPM's (see SCHEDULE II) as follows:

23. ACPM R & D Uranium	}	combine membership
24. ACPM Primary Raw Materials		
22. ACPM Paper & Board Recycling	}	combine membership
25. ACPM Urban and Industrial Waste Recycling		
15. ACPM Geothermal Energy	}	combine membership as far as possible
43. ACPM Geothermal Demonstration Projects		
4. ACPM Solar Energy	}	combine membership as far as possible
45. ACPM Solar Energy Demonstration Projects		
14. ACPM Energy Conservation	}	combine membership as far as possible
46. ACPM Energy Saving Demonstration Projects		

If fully implemented, these suggestions would effectively reduce the total number of ACPM's/COMAC's from 51 to 46.

The note argued that it would be too cumbersome to seek to alter Council Decisions in view of the relatively small improvements which might result. It also believed that a reduction in the number of ACPM's would not necessarily mean a corresponding reduction in the number of experts consulted. In drawing up future programmes, however, it recommended that the possibility of combining ACPM functions should be systematically examined. It was felt that a more drastic reduction would mean "the loss of the high degree of scientific authority which was a feature of these committees. The price of such a reduction would be the abandonment of their advisory role vis-à-vis the Commission for which they were established". This pinpoints the main objection to a reduction, namely that the Member States generally regard the creation of an ACPM or COMAC as a precondition for a Community R & D programme in a given area.

The clause allowing Member States to nominate their experts "by applying whatever criteria it deems appropriate" has led to the domination of the ACPM's by representatives of Government Departments and Government Laboratories or research organizations. There is relatively low representation of industry, universities and other groupings. One survey carried out in 1977 on a number of ACPM's gave the following breakdown:

⁽¹⁾ OJ No. C 192 of 11 August 1977, page 2

Composition of ACPM's

Country	Central Govt Rep.	Govt. Lab. or Research Org	Ind incl Nationalized Ind	Academic or Other	Status Uncertain	Total
Belgium	22	20	6	5	2	55
Denmark	-	14	2	12	4	32
France	7	38	8	2	1	56
Germany	21	20	9	14	1	65
Ireland	5	13	1	6	2	27
Italy	2	29	16	5	2	54
Luxembourg	4	1	-	-	-	5
Netherlands	11	27	8	7	2	55
UK	13	30	8	2	-	53
TOTAL	85	192	58	53	14	402
%	21	48	14	13	3	100

Source: (4)

It would be interesting to obtain additional figures covering all the ACPM's and COMAC's now in existence.

Some ACPM's have a considerable workload in assisting in drawing up contracts immediately after the

Council has adopted the R&D programme in question. In some cases therefore the ACPM's are assisted by a number of specialized working groups. This is also the case where a programme spans over a wide technical field.

VII. OTHER BODIES NEAR THE COMMISSION

Interservice Committee on Research and Development (CIRD)

To ensure coordination between the different Directorates-General, the Commission has an *Interservice Committee on Research and Development (CIRD)*. The Committee, which is modelled on the interdepartmental committees in several Member States, is composed of officials from the different Directorates-General concerned with R&D policy. It is chaired by the Director-General of DG XII. The task of CIRD is to look at the cross-link implications of R&D proposals and to make sure that the proposals are in line with the Community's different sectoral policy objectives.

The Scientific and Technical Committee (STC)

The Scientific and Technical Committee was established in 1957 pursuant to Article 134 of the EURATOM Treaty. It is composed of 27 eminent scientists and academics nominated by the Council after consultation with the Commission. The STC must be consulted by the Commission on all questions relating to nuclear research and training programmes under the EURATOM Treaty (Article 7). Secretarial services are provided by the Commission. Given that a significant part of Community R&D is now non-nuclear, it is not clear how its terms of reference fit the current situation.

The European Research and Development Committee (CERD)

The CERD was set up by the Commission on 14 June 1972. It is composed of 21 experts of standing chosen by the Commission from a variety of sectors. Its role is to provide the Commission with a source of high level independent scientific advice, particularly on the wider-ranging issues of Community policy on science and technology. Its secretariat is provided by the Commission.

- CERD currently has two ad hoc working groups:
- European society and its interactions with science and technology (ESIST);
 - energy.

Standing Committee on Agricultural Research (SCAR)

The Standing Committee on Agricultural Research was created by the Council on 27 June 1974. It is composed of representatives of the Member States and is chaired by a representative of the Commission. It advises the Commission on the coordination and promotion at Community level of agricultural research work undertaken in the Member States. The secretariat of the Committee is provided by DG VI (Agriculture) of the Commission.

General Advisory Committee of the JRC (GAC)

The GAC is made up of representatives from scientific, industrial and governmental institutions nominated by the Governments of the Member States. Its main task is to help the Director-General of the JRC in the preparation of draft research programmes for the JRC.

The Director-General keeps the GAC regularly informed on the management of the JRC specifically on the main contracts and agreements signed, staff management policy, the adoption of a detailed programme of the JRC and any major changes to the programmes previously laid down. On the basis of this information, the GAC may draw up opinions for submission to the Director-General. It also considers the opinions of the ACPM's relating to the direct actions. The GAC is chaired by one of its members for a two-year term. The Director-General of the JRC takes part in the discussions and has the right to vote. Secretarial services are provided by the JRC.

The JRC also has an internal advisory committee known as the *Scientific Committee* (SC). The Committee is made up of the heads of the main Departments of the JRC, as well as representatives of scientific and technical staff. It is regularly consulted by the Director-General of the JRC and takes part in the drawing up of research projects.

Committees associated with the thermonuclear fusion programme

The Community, under the Euratom Treaty, has already carried out four five-year research programmes on "controlled thermonuclear fusion and plasma physics" (by "indirect action") in which it coordinates and contributes to the work being done by the different Research Associations in the Member States. With the decision in 1977 to construct the experimental device JET (Joint European Torus) at Culham in the United Kingdom, it has become by far the largest individual Community programme, perhaps the single example of major Community involvement in "big science". The latest five-year rolling programme proposed for 1979-1983 has a Community budget of 348.7 MEUA. There are a number of Committees which play a consultative and coordination role at different levels.

The *Liaison Group*, which is composed of leading scientists of the associated bodies and the Commission functions as an ACPM (see section VI). It is currently assisted by six advisory groups.

The *Committee of Directors* (C of D) is composed of the Directors of the associated laboratories and JET and the Commission's Director of the fusion programme. It is responsible for the preparation of the decisions concerning the programmes, the conditions of interventions by the Commission, the mobility and exchange of personnel, and for various problems concerning collaboration also outside the associated laboratories and outside the Community. Furthermore, the C of D may be requested to act as a technical committee for the CCF. Ad hoc Groups and Coordinating Committees are set up by the C of D when necessary in specialized areas.

The *Consultative Committee on Fusion* was established on 26 March 1976 as an advisory body to the Commission on the basis of Article 135 of the EEC Treaty. It is composed of one member (generally the senior Government official responsible for energy R & D) and one expert from each Member State, each associated State and the Commission, who are appointed for a five-year period. The CCF gives its views, which are also sent to the Council for information, on the implementation of the Community's current fusion R & D programme, the JET project, the drawing up of future programmes, and the coordination at Community level of national fusion R & D.

The JET project itself was placed under the aegis of a Joint Undertaking on 1 June 1978. Its management structure which is defined in its statutes⁽¹⁾ consists essentially of the *JET Council*, the *JET Executive Committee* and the *Project Director*.

ECSC Research Committees

The Coal Research Committee (CRC) is composed of representatives of producers, researchers, independents (academics) and trade unions from the coal-producing Member States. It advises the Commission on the coal research programme carried out under the ECSC Treaty.

The task of monitoring research projects is assigned to various *Expert Committees* which are set up by the Commission to ensure that the work is properly carried out. These Committees, of which there are currently 9, are made up of representatives of coal producers and research workers from the Member States involved. The Expert Committees generally meet twice yearly. They are administered by the Commission which keeps them regularly informed of the state of the work on the different projects.

Similar committees exist for research into steel and medico-social matters deriving from the ECSC Treaty.

Advisory Committee on Industrial Research and Development (CORDI)

The CORDI was established by the Commission on 29 June 1978. The Committee is composed of 25 members (15 from UNICE, 4 from CEEP, 3 from ETUC and 3 representing research bodies (FEICRO). Provision is also made for a further 8 persons to attend the Committee's meetings as observers. The detailed terms of reference and composition of the Committee are contained in the Commission's Decision which is given in SCHEDULE III.

Specialized scientific committees

The Commission has also set up a number of specialized scientific Committees, which are not however directly connected with Community R & D.

⁽¹⁾ O.J. No. L 151 of 7 June 1978, page 10

work. Each is composed of 15 members chosen by the Commission for their knowledge of the field in question. Secretarial services are provided by the Commission. These are the scientific Committees on:

- foodstuffs;
- animal foodstuffs;
- pesticides;
- cosmetology (preparation of cosmetics);
- scientific and technical training.

Consultative Committee of the European Coal and Steel Community

The Consultative Committee is the ECSC counterpart of the Economic and Social Committee (EEC and EURATOM). Set up in 1953, it is composed of 81 members drawn in equal numbers from three categories within the coal and steel industry — producers, workers

and consumers and merchants. The Commission must consult the Committee on numerous points specified in the Treaty before taking decisions. In particular, the Commission must consult the Committee on the general aims of the Community's work, on its programmes and on proposals designed to promote research of a technical and economic nature in the fields of coal and steel production and consumption and the safety of the workers in these industries. In practice, the Committee is also consulted or kept informed on all major developments in the coal and steel market.

The Consultative Committee has four sub-committees, one of which is the Sub-Committee for Research Projects. There would seem to be a partial overlap here with CRC even though the role of the former is more technical, while that of the latter more political.

VIII. EUROPEAN COOPERATION IN THE FIELD OF SCIENTIFIC AND TECHNICAL RESEARCH (COST)

The COST system was set up in 1970 as a mechanism for R&D cooperation between the six original Member States and the four applicant countries. Other European countries joined, bringing the total to 19. Its central organization is the *Committee of Senior Officials* from the participating countries. The Community itself takes an active part in the COST projects, and lends its aid in implementing them by undertaking the work of coordination and providing secretarial services. The secretariat of the Committee of Senior Officials is provided by the general secretariat of the Council of Ministers.

Initially, a number of *Technical Committees* were set up in different fields to draw up proposals for research projects, covering:

- data-processing;
- telecommunications;
- new means of transport;
- oceanography;
- metallurgy;
- nuisances;
- meteorology equipment.

A list of the COST projects, currently running or proposed, is given in SCHEDULE II.4. The most notable COST project to date has been the European Centre for Medium Term Weather Forecasting which has been established in the United Kingdom, and in which 15 countries participate.

Prior to the Council Resolution of 14 January 1974, the COST system was a useful means of cooperation in areas where the Treaties did not provide for Community R&D. After this date, it became possible to carry out more work within the Community framework, under Article 235 of the EEC Treaty. The Commission, in reply to a memorandum by the Belgian government, redefined COST's role as being the forum for scientific cooperation between the Community and

European non-member countries. Since 1974, there is a certain preference with the Community for the pursuit of projects which were originally suggested within the COST system in the form of Community Concerted Actions, where appropriate with the involvement of non-member countries.

In accordance with a procedure approved by the Council on 13 July 1978, COST cooperation may now take one of the following forms:

Category I: Community programmes, with which interested COST States which are not Member States of the Community may be associated;

Category II: COST Projects which also form the subject of a Community programme;

Category III: Cost projects where there is parallel participation by Community Member States and the Community itself;

Category IV: COST projects where there is no participation by the Community.

For *Category I* projects, an international arrangement is negotiated to associate the interested COST States with the Community programme.

Category II as a rule relates to instances where there is a concerted Community Programme. Community-COST Concertation Agreements are drawn up which provide for the creation of *Community-COST Concertation Committees* and information-exchange about national programmes.

Category III and *Category IV* projects, once approved, are entrusted to *Project Management Committees* which operate independently of the rest of the COST Committee structure.

For specific research projects, *Technical Sub-Committees* may be set up on an ad hoc basis within

their own terms of reference, to draw up the technical content. In instances where the legal basis has to be worked out, the dossier is passed on to an ad hoc *JAF* (*Juridical, Administrative and Financial Affairs*) Group which drafts the actual agreement.

IX. THE EUROPEAN PARLIAMENT

When the Commission submits a proposal to the Council, the latter generally requests the opinion of the European Parliament before taking a decision. Such consultation is obligatory in the case of R & D proposals based on Article 235 of the EEC Treaty. The Parliament's opinion which, if necessary, proposes amendments to the plan, is forwarded both to the Council and the Commission. The Commission may, on the basis of Art. 149, para. 2 of the EEC Treaty, amend its original proposal specifically in the light of the Parliament's opinion. The Commission has frequently used this procedure on R & D proposals in recent years, but mainly to amend budgetary procedures rather than to materially alter the programme content.

The Parliament also has certain budgetary powers, particularly in connection with "discretionary expenditure" which is not required by provisions in the Treaties. In addition, the Parliament has certain powers of supervision over the Commission which are set out in Arts. 140, 143 and 144 of the EEC Treaty.

The Parliament's opinions on R & D proposals are generally prepared by its *Committee on Energy and Research*. Where appropriate other sectoral committees are also associated with the work. The *Budget Committee* deals with the financial aspects and has a *Budgetary Control Sub-Committee* to review the way in which funds are spent.

X. THE ECONOMIC AND SOCIAL COMMITTEE

The ESC was set up to provide the Commission and Council with the collective views of economic and social interest groups on all major policy areas covered by the EEC and EURATOM Treaties. It is composed of 144 members drawn from three groups — employers, workers and various interests. It must be kept informed of research and training programmes based on Art. 7 of the EURATOM Treaty. Generally, its opinion is also requested by the Council on other R & D proposals. The ESC also prepares a number of opinions and studies on its own initiative.

The ESC opinions are drawn up in one of its nine Sections, the *Section for Energy and Nuclear Questions* being responsible for research policy. Certain R & D proposals of a specifically sectoral nature (e.g. agriculture, data-processing) may be assigned to the appropriate Section. Within a Section, the work of drafting the opinion is usually given in the first instance to a *Study Group* set up for the purpose.

In preparing opinions on R & D proposals at the request of the Council, the ESC is somewhat handicapped by its location almost at the end of the decision-making chain (see ILLUSTRATION III). At this stage, it is difficult for the Committee to materially influence the programme package which has already been the result of political bargaining.

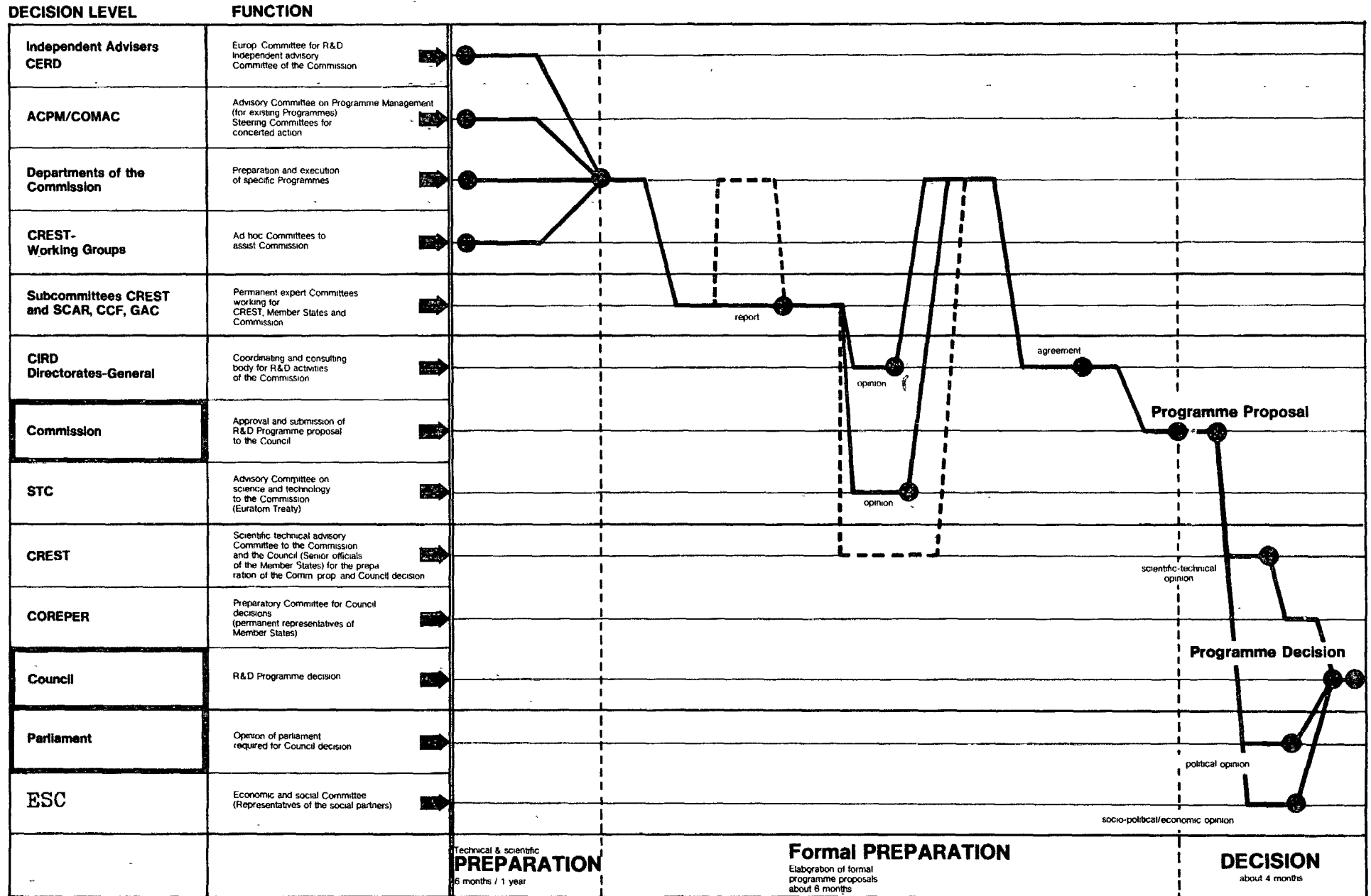
On the whole this indicates that representation of the social partners on the advisory bodies is low and sporadic. Only four bodies, the ESC, the Consultative Committee of the ECSC, the Coal Research Committee (CRC) and the Advisory Committee on Industrial R & D (ACIRD) provide for such representation. The consultative committee of the ECSC and the CRC only cover the coal and steel sector which accounts for almost 14% of annual Community R & D expenditure. The Advisory Committee on Industrial R & D currently has no programme to advise on.

XI. COMMENTS

The Community has an extensive range of decision-making and consultative bodies dealing with science and technology policy (ILLUSTRATION II). The ECSC, EEC and EURATOM Treaties provide three separate legal bases for Community activity, which in part explains its structural diversity. In addition, the different forms of Community involvement in R & D

(Direct, Indirect and Concerted Actions) and actions in the context of European cooperation (COST) may mean that there are several distinct initiatives for a given subject. Since the Treaties were signed, bodies have been created to meet specific needs and circumstances. The institutional system is now one of considerable complexity. For any given subject, there

SUMMARY OF DECISION-MAKING PROCESS FOR THE ADOPTION OF COMMUNITY R & D PROGRAMMES



NOTES 1. In the case of the ECSC the Commission decides after consultation of the Consultative Committee and with the assent of the Council.
2. The decision making process shown is not fully applicable to direct action programme

appears to be a number of Committees, located at different points throughout the network. The precise demarcation of their respective roles is often unclear. In certain cases, "de facto" and "de jure" responsibilities differ substantially. The result is a lack of transparency in the system.

In addition to the institutional implications, there is also a political problem. The National Delegations generally insist on the creation of Committees for each new Community R & D programme. In this way, the transfer of new funds to the Community is being offset by control carried through by the member States. Underlying this, there is a fundamental policy choice. Should the Community's involvement in R & D take the form of "à la carte" intergovernmental cooperation or should it form part of an overall Community policy on science and technology designed to further socio-economic needs?

The reorganization of Community R & D management structures is a politically difficult task. The

Commission in its "Common Policy on Science and Technology" Communication (2) in June 1977 described the system in considerable graphic detail. It stated that "for the future it will be necessary to analyze the individual structures and procedures, advisory bodies and decision-making processes to determine their effectiveness" and inferred that the Member States were partly responsible for "the present, at times heavy, Community procedures". The Commission has not published such an analysis in the intervening period. This would in any case be a difficult task for the Commission, as the creation of new Committees and the maintenance of existing ones, are often part and parcel of agreed programmes. Within the Council, there may also be a certain reluctance to try and alter the delicate balances that have already been achieved and, in doing so, to risk protracted negotiations.

Despite these difficulties, the Committee considers that the Community Institutions should systematically tackle all the above-mentioned problems.

XII. CONCLUSIONS AND RECOMMENDATIONS

A Community policy for science and technology

The Committee has already underlined the vital importance for the Community of developing a vigorous policy in the field of science and technology. The Committee took a stand on this issue in its Study of 25 May 1976 on the "Objectives and Priorities for a Common Research and Development Policy".

The organization and management of Community R & D, the subject of this present Study, must therefore be designed in such a way that progress can be made as rapidly as possible toward the attainment of these development objectives.

The Committee endorses the increase in the number and diversification outside the nuclear field of Community R & D projects in recent years as a step toward such a broadly-based Community policy. The Committee has already welcomed this trend, in its Study of 26 May 1976 on Objectives and Priorities of a Common Research and Development Policy (13). At the same time, there is a need to ensure that the different individual research programmes are not determined on an ad hoc basis but are drawn up explicitly within the overall framework of Community science and technology policy objectives. As the number of programmes increases, so does the need for closer coherence. The Committee has a number of recommendations to make, which are contained in the following sections. They include:

- the introduction of a multiannual indicative projection for all Community research;
- the creation of a more coherent research administration structure within the Commission;
- significant simplification of the advisory committee system;
- strengthening of the links between national and Community R & D policies;

- securing the appropriate involvement of economic and social interest groups in the system;
- the closer involvement of research workers in Community R & D management;
- encouraging innovation;
- dissemination and utilization of research findings;
- strengthening evaluation procedures for Community R & D, also those on the consequences for employment and economic expansion;

Planning R & D and the Community's science budget

In examining the national systems, the Committee notes that several Member States have put greater emphasis on research planning in recent years, even if the concept has been more highly developed in some Member States than in others.

The Committee therefore believes that the link between overall policy aims and the adoption of specific Community R & D measures could be successfully strengthened if the following provisions were adopted:

- all programmes concerning the Community should be grouped together as the part of a multiannual indicative projection. This is not an easy thing to do given the differing timescales of the various actions but the difficulties are not insurmountable, especially if the multiannual projection (e.g. covering five years) is regularly updated (e.g. every two years) according to the "rolling plan" technique.
- all expenditure on R & D should be included each year in a special chapter of the Community budget; it would then be possible to find out whether expenditure is in line with consistent medium-term forward projections.

The multiannual indicative projection could be submitted for consideration to the European Parliament and the Economic and Social Committee, who might find the exercise a useful supplement to the task of considering R & D projects piecemeal. It should also be considered by the Council and consultative bodies such as CREST.

Commission administration structure

To achieve a genuine Community research and development policy, it is important that it should be promoted and administered by a coherent administrative structure within the Commission. Setting aside the historical and legal problems already mentioned in the Study, it is hard to justify on objective grounds the existence of three different Directorates-General within the Commission all primarily involved in the broad field of science and technology. The same is true of the division of responsibility for "energy research" and "energy demonstration" projects between two different Directorates-General. While considerable efforts are made to ensure coordination between the different Commission services, in particular by the Interservice Committee on Research and Development (CIRD), this is at best only a partial solution to the problem. Notwithstanding the difficulties involved, efforts should be made to achieve a more rational long-term solution, reflecting as far as possible the requirements of the future rather than the constraints of the past. The Committee recommends a reorganization along these lines, as urged in the recently published Spierenburg Report (18).

The Committee, however, also recognizes the role of R & D in supporting the Community's sectoral policy objectives (energy, environment, agriculture, etc.). This means that if there is to be an efficient coordination of research policy, the concerns and policy decisions of departments in the various sectors must be respected; centralization on the other hand must be avoided since it is likely to have a paralyzing effect. The aim is not to achieve a balance between opposing tendencies but rather to ensure that balanced decisions are made within a coherent framework.

The network of advisory bodies

The build-up of bodies advising the Commission and the Council, in particular the CREST network of Committees and the Advisory Committees on Programme Management, has undoubtedly provided the Community with access to a wide range of expert advice. The practice of seeking external advice should certainly be maintained and improved, while at the same time ensuring that the advisory system is straightforward, that it reflects present-day requirements, and that it takes account of other recommendations contained in this Study.

However, since it is easier to set up a new committee than to reform an existing one, particular care is needed to ensure that the number of these committees does not overburden R & D decision-making and management. If uncontrolled, the number of Committees and

administrative steps involved in the process can create a considerable strain on both Community and national resources, particularly on the manpower side. The more time that Community staff have to spend in servicing committees, the less is available for policy coordination. The more time that national experts have to devote to the administration and management of Community R & D, the less is available for actual research. Vigilance is therefore needed to keep the situation from getting out of hand.

The Committee accordingly recommends as a short-term measure that no new committee should be approved unless it can be shown that its creation is absolutely necessary, i.e. that it would make a genuine contribution to the Community's R & D work and that the work cannot be satisfactorily carried out by adapting the terms of reference and membership of existing bodies.

To increase the efficiency of existing Committees, the ESC considers that greater attention should be paid to clearly demarcating responsibilities. Members of the various Committees must know exactly what role they have to perform so that their contribution can be an effective one.

A simple path is needed to speed up decision-making. Otherwise projects may be out-of-date by the time they are adopted.

In the longer term — though as soon as possible — a comprehensive institutional blueprint should be drawn up which would not preclude revision of the Treaties.

The strengthening of links between national and Community R & D policies

The Committee has noted that not only the CREST network of committees but also the ACPM's and COMAC's as well as several other bodies advising the Commission are heavily dominated by the representatives of the Governments of the Member States (see section XI). It recognizes that it is important for the Member States to participate in the formulation of Community R & D policy and in determining the work to be carried out. However, it believes that the Member States' role in decision-making is fully guaranteed by the existing Council procedures. It further believes that the CREST network of committees provides appropriate and effective channels for making the views of the Member States known on policy questions.

The Committee therefore believes that the ACPM's and COMAC's should have a broadly-based membership whose task is to ensure that the research responds to real needs, that it is efficiently carried out and that optimal use is made of the results. The ACPM's should not simply be regarded as a duplicate system for representing governmental interests of the Member States. The Committee recommends that overall — if not necessarily in each individual Committee — there should be an adequate and balanced representation of Government circles, research organizations, research workers, academic circles, user industries and

interested economic and social groupings, insofar as such bodies are not already represented. This would also help to meet the recommendations made in the following paragraphs.

To ensure that the system is more clearly understandable, the Committee recommends that the composition of each ACPM and COMAC be published periodically in the Official Journal with an indication of the professional background of its members:

Involvement of the economic and social interest groups

The Committee has noted from its review of practice in the Member States that the economic and social interest groups can be involved in R & D decision-making and management in two different ways.

- a) at a general policy level;
- b) at a sectoral level (industrial, agricultural, social R & D, etc.).

The same distinction may be applied to Community activity.

With regard to general policy, the views of the various economic and social interest groups are represented by the Economic and Social Committee. However, as has been pointed out in section X, its current position almost at the end of the decision-making chain seriously reduces its ability to materially influence the direction of Community R & D. The Committee considers that these problems must be overcome by moving the ESC upstream in policy formulation.

In the field of sectoral research, the Community has the following major advisory bodies:

coal and steel: the Consultative Committee of the ECSC and the Committees for Coal Research, Steel, and Medico-Social Questions.

industry: the Advisory Committee on Industrial Research and Development (CORDI)

agriculture: the Scientific Committee on Agriculture Research (SCAR)

The Committee is in principle in favour of such sectoral bodies representing specialized economic and social interests. But it believes that care must be taken to ensure that:

- their membership is as representative as possible;
- it does not lead to a further proliferation of committees;
- it does not duplicate the work of the Economic and Social Committee

In this regard, the Committee specifically recommends:

- that the Commission surveys and, if necessary, proposes ways of avoiding the possible duplication of responsibility between the research sub-committee of the Consultative Committee of the ECSC and the Coal Research Committee;

- that the Scientific Committee on Agriculture Research (SCAR) be made more broadly representative of agricultural interests;
- that, in other sectors, the Commission use, when necessary, existing advisory committees outside the research field, to obtain advice on sectoral aspects of Community R & D work.

Closer involvement of research workers in the management of Community R & D

The Committee believes that it is essential to involve research workers more closely in research management, in order to ensure good R & D. The Committee notes that such procedures already exist for the "Direct Action" research carried out by the JRC.

Encouraging innovation

The Committee is fully aware that the usefulness of R & D is determined by the extent and speed with which its results are put to practical use. The Community's administrative system must therefore be designed to ensure that the research work being done reflects real requirements and that there is a smooth baton-change between the laboratory, industry and other users. The Committee accordingly recommends that greater attention should be given to users' interests at all levels of the Community advisory system. This could be achieved by broadening the composition of the ACPM's as suggested in section XII as well as increasing the number of user representatives on other advisory committees.

The Committee also believes that the Community system should be specifically designed to bring research "customers" and research "contractors" of the nine Member States into closer contact with one another. This would encourage the wider use of research results, while at the same time helping to open up the Community market.

The Committee, however, also believes that care is needed to see that the application of the above suggestions does not create an imbalance between short-term objectives and longer term research goals.

Research findings — dissemination and utilization

Through the use made of scientific findings, Community research must be able to make a direct contribution to the economic development of the Community and to the achievement of its social objectives.

This calls for special attention to be paid — and systematic encouragement to be given — to ways of making the best possible use of Community research findings. DG XIII is now making a major and continuous effort to this end but action still needs to be stepped up and integrated within an overall "policy". The Committee considers that future action should concentrate on:

- improving the dissemination of Community research findings in conjunction with potential

users and the public bodies concerned. Specific action would need to be taken to make it easier for information to find its way to small and medium-sized undertakings.

- a large-scale campaign to inform industries of the industrial property rules followed within the framework of Community R & D action, and possibly a new discussion of these rules with industry (a certain ignorance of the basic rules sometimes leads to a reticence on the part of firms to take part in Community actions).
- wide-scale dissemination of the economic and social consequences of the results of the application of Community R & D, in particular as regards job safety and organization and the communication of these results to workers' representatives.
- more discussions, e.g. between researchers and users, thereby extending research activities (inventories of research projects, promotion of decentralized dissemination systems on a national basis).

The Committee recommends that the Commission concentrate on organizing occasional specialized international symposia, as has already been done for subjects such as energy storage, photo-voltaic conversion, hydrogen and radiological protection. It also believes the Commission has a special role in programming such activity in order to avoid "international conference saturation."

Strengthening evaluation procedures for Community R & D

The Committee believes that systematic evaluation of Community research is essential in order to ensure that optimal use is made of the limited financial resources available. High priority must be given to this task in the management of Community research. It follows that management structures must be designed specifically with this aim in mind. In the Committee's view, the ACPM's must have a primary responsibility in this regard.

The Committee notes that there are many different techniques for evaluating R & D and that there is no universally accepted standard technique. However, the Committee would refer to the discussions of the seminar organized by the Commission on the subject (19). The Committee endorses the seminar's conclusion that the methods adopted should aim at simplicity without bureaucratization. The Committee would lay particular stress on several of that seminar's suggestions namely that the evaluation process should:

- involve "users" as well as performers of R & D and its sponsors (this could be done by following the recommendations set out in section XII);
- involve as early as possible further efforts aimed to identify essential market needs and mechanisms, both in economic and social terms.

The Committee also endorses the conclusion of the seminar that "account should be taken of the critical

nature of the problem of informing political decision-makers and the public at large on the programmes and alternative strategies regarding R & D. Information to the public at large not only responds to the unanimously recognized right of access to information, but it is also useful in providing "input" elements on the needs and aspirations of the people of Europe".

The Committee recommends that an examination also be made of the consequences of the results of research for employment and economic expansion

Research Cooperation with Third Countries

The Committee considers that the Community's research structures should also reflect the fact that many international research projects are of interest not just to the nine Member States but also to third countries. The Committee would point to the Community's experience in involving third countries through the COST system. The Community currently also has links with many of the other international bodies and non-Member States engaged in research cooperation. The Committee believes that such links are essential

The Committee holds that the Community's aim must be to avoid duplication of the effort and responsibility between these organizations and at the same time, to keep the network of international contacts as simple and as straight-forward as possible.

The Committee notes that the enlargement of the Community from nine to twelve countries is likely to affect the current relatively high level of homogeneity in research and lead to more heterogeneity. The Committee would reiterate the demand made in its Opinion on enlargement (CES 766/79), namely that an in-depth study be made of the Community's administrative machinery to enable it to be adapted to the new dimension which the accession of three new States will entail.

On the issue of cooperation with developing nations, the Committee feels that the Community must make its own specific contribution in addition to those of the Member States. The Community must shoulder the responsibilities incumbent on it under the agreements (particularly the Lomé Convention) concluded with the LDC's. In addition R & D policy should take account of the impact which it has on Community development policy at sectoral level.

Follow-up

In conclusion, the Committee calls on the Commission and the Council to act on the recommendations contained in this Study. It also recommends that the European Parliament, which has a certain supervisory role conferred on it by the Treaties, should follow up the issues raised in this Study and thereby help ensure that appropriate and timely solutions are found.

REFERENCES

- 1 Commission of the European Communities, *Comités situés auprès des Institutions Communautaires ayant des activités dans le domaine de la politique scientifique et technique* (Doc. CREST/59/78), Brussels, 1979.
- 2 Commission of the European Communities, *The Common Policy in the field of Science and Technology* (Doc. COM(77) 283 final), Brussels, June 1977.
- 3 Commission of the European Communities, *The Comparison and Coordination of National Policies and Programmes in the Energy Research and Development Sector* (Doc. EUR 5911), Brussels-Luxembourg, 1978.
- 4 House of Lords, Select Committee on the European Communities, *Research and Development in the EEC*, House of Lords, Session 1977-1978, Sixth Report. HMSO, London 1977.
- 5 Commission of the European Communities, *Energy Research and Development Programme Status Report 1977*, Nijhoff, Den Haag, 1977.
- 6 Commission of the European Communities, *Environment and the Quality of life — Final Reports on the research sponsored under the First Environmental Research Programme*, Brussels-Luxembourg, 1978 (Doc. EUR 5170).
- 7 Commission of the European Communities, *Annual Report 1976 Programme Radioprotection*, Brussels-Luxembourg, 1976 (Doc. EUR 5711).
- 8 Economic and Social Committee — General Secretariat, *Survey of Community Committees for the Representation of Lay Interests* (Doc. R/CES 737/77).
- 9 Commission of the European Communities, *The Scientific and Technical Research Committee* (CREST), Brussels-Luxembourg 1975.
- 10 European Communities, *Government Financing of Research and Development — 1970-1978*. Statistical Office of the European Communities, Luxembourg, 1978.
- 11 *Rationalization of Consultative Committee's Programme Management* — Memo from the Commission dated 13 November 1978 (CREST 57/78)
- 12 *Science and Technology in the European Communities: The History of the COST Projects*, AKED, N.H., and GUMMET, P.J., Comment by KLOSE, A., in Research Policy No. 5, 1976, pp.276-300
- 13 Economic and Social Committee's Study on the *Objectives and Priorities for a Common Research and Development Policy*, 25 May 1976 (CES 589/76) (The "Noordwal Study" also available in booklet form)
- 14 Committee on Scientific and Technical Research, *Working papers for the meeting between representatives of national and Community R & D policies (COPOL 79)*, 24 and 25 April 1979.
- 15 *The measurement of Scientific and Technical Activities (FRASCATI MANUAL)*, OECD, Paris 1976.
- 16 Commission of the European Communities, *The Common Policy on Research and Technology*, Brussels, 1979 (COM(79) 281 fin)
- 17 European Communities, *Analysis of the research and development potentials of the Member States of the European Community* (Report of M.D BLOSSIER), Brussels, 1979 (CREST 1211/79)
- 18 Report drawn up by an independent Committee at the request of the Commission on *Proposals for reforming the Commission of the European Communities and its Departments* (SPIERENBURG Report) Brussels 1979.
- 19 Working paper of the seminar organized by the European Commission on the evaluation of research and development, Copenhagen, 29 June — 1 July 1978

Glossary

ACPM	Advisory Committee on Programme Management	ECSC	European Coal and Steel Community
CCF	Consultative Committee on Fusion	ESC	Economic and Social Committee
CEEP	European Centre for Public Enterprise	ETUC	European Trade Union Confederation
CERD	European Research and Development Committee	EURATOM	European Atomic Energy Community
CIDST	Committee for Scientific and Technical Information and Documentation	FEICRO	Federation of European Industrial Co-operative Research Associations
CIRD	Interservice Committee on Research and Development	GAC	General Advisory Committee of the JRC
COMAC	Committee on Concerted Actions	IDST	Scientific and Technical Information and Documentation
COREPER	Committee of Permanent Representatives	JAF	Juridical, Administrative and Financial Affairs Group (COST)
COST	European Cooperation in the Field of Scientific and Technical Research	JRC	Joint Research Centre
CREST	Scientific and Technical Research Committee	SAC	Special Agricultural Committee
CRC	Coal Research Committee	SC	Scientific Committee of the JRC
CRM	Committee on Medical Research	SCAR	Standing Committee on Agricultural Research
		STC	Scientific and Technical Committee
		UNICE	Union of Industries of the European Community

SCHEDULES

SCHEDULE I

Public R & D expenditure by the Commission of the European Communities in 1978

Heading	M. EUA	%
1. Exploration and exploitation of the earth and its atmosphere	3.4	1.3
2. Planning of human environment	0.3	0.1
3. Protection and improvement of human health	40.0	15.7
4. Production, distribution and rational use of energy	165.8	65.0
5. Agricultural productivity and technology	3.0	1.2
6. Industrial productivity and technology	33.4	13.1
7. Social and sociological problems	6.5	2.6
8. Exploration and exploitation of space	1.9	0.8
9. Defence	-	-
10. General promotion of knowledge	0.6	0.2
	TOTAL	254.9
		100.0

Source: Statistical Office of the European Communities (10)

SCHEDULE II.1

EUROPEAN COMMUNITY RESEARCH PROGRAMMES

PROGRAMME	STATUS	COST (EC BUDGET)	FC STAFF	DURATION			ADVISORY COMMITTEES ON PROGRAMME MANAGEMENT	REMARKS	REFERENCES	
				YEARS	START	END			PROPOSAL	DECISION (O.J.)
DIRECT ACTIONS		(**) (MUA)	(*)					(*) Staff figures are limit set for 31.12.80 (**) Figures updated in 1978 budget		
1 Reactor Safety	Running	81.83	531	4	1.1.77	31.12.80	1. ACPM "Reactor Safety"		L 200/4	8.8.77
2 Plutonium Fuels and Actinide Research	Running	46.49	212	4	1.1.77	31.12.80	2. ACPM "Plutonium Fuels and Actinide Research"		L 200/4	8.8.77
3. Nuclear Materials and Radio-active Waste Management	Running	22.37	133	4	1.1.77	31.12.80	3. ACPM "Treatment and Storage of Radioactive Waste"		L 200/4	8.8.77
4 Solar Energy	Running	14.94	70	4	1.1.77	31.12.80	4. ACPM "Solar Energy"		L 200/4	8.8.77
5 Hydrogen	Running	16.04	100	4	1.1.77	31.12.80	5. ACPM "Hydrogen"		L 200/4	8.8.77
6. Conceptual Studies on Thermo-nuclear Fusion Reactors	Running	12.75	62	4	1.1.77	31.12.80	6. "Liaison Group" Fusion and Plasma Physics		L 200/4	8.8.77
7. High Temperature Materials	Running	10.31	50	4	1.1.77	31.12.80	7. ACPM "High Temperature Materials"		L 200/4	8.8.77
8 Environment and Resources	Running	37.44	227	4	1.1.77	31.12.80	8. ACPM "Environment"		L 200/4	8.8.77
9. Measurements Standards and Reference Techniques	Running	61.60	328	4	1.1.77	31.12.80	9. (Nuclear) ACPM "Central Bureau for Nuclear Measurements" 10. (Non-nuclear) ACPM "BCR"		L 200/4	8.8.77
10 Service and Support Activities	Running	33.71	234	4	1.1.77	31.12.80	11. ACPM "Informatics" 12. ACPM "Control of Fissile Materials"		L 200/4	8.8.77
- Supplementary Programme (High Flux Reactors - HFR)	Running	45.51	91	4	1.1.77	31.12.80	13. ACPM "HER"			
		382.98	2038							

SCHEDULE II.2

EUROPEAN COMMUNITY RESEARCH PROGRAMMES

PROGRAMME	STATUS	COST (EC BUDGET) (MUA)	EC STAFF	DURATION			ADVISORY COMMITTEES ON PROGRAMME MANAGEMENT	REMARKS	REFERENCES	
				YEARS	START	END			PROPOSAL	DECISION (O J)
INDIRECT ACTIONS										
1. Energy Conservation	Running	11.38	6	4	1.7.75	30.6.79	14 ACPM "Energy Conservation"	New proposal issued	COM (73) 388	L 10 13.01.77
2. Production and Utilisation of Hydrogen	Running	13.24	4	4	1.7.75	30.6.79	- (covered by 5 above)	New proposal issued	COM (78) 388	L 10 13.01.77
3. Solar Energy	Running	17.50	6	4	1.7.75	30.6.79	- (covered by 4 above)	New proposal issued	COM (78) 388	L 10 13.01.77
4. Geothermal Energy	Running	13.00	4	4	1.7.75	30.6.79	15 ACPM "Geothermal Energy"	New proposal issued	COM (78) 388	L 10 13.01.77
5. Energy Systems Modelling	Running	3.88	7	4	1.7.75	30.6.79	16. ACPM "Systems Analysis"	New proposal issued	COM (78) 388	
6. Biology - Health Protection	Running	39.00	68	5	1.1.76	31.12.80	17 ACPM "Biology - Health Protection"			L 74 20.3.76
7. Management and Storage of Radioactive Waste	Running	19.16	4	5	1.1.75	31.12.79	- (covered by 3 above)			L 178 9.7.75
8. Plutonium Recycling	Running	4.75	3	5	1.1.75	31.12.79	18 ACPM "Plutonium Recycling"	Extended to 31.12.79		L 349 28.12.74 L 291 17.10.78
9. Environment	Running	16.00	10	5	1.1.76	31.12.80	19 ACPM "Environment"	New proposal issued		L 74 20.3.76
10. Fusion	Running	124.00	113	5	1.1.76	31.12.80	- (covered by 7)			L 90 3.4.76
+ JET	Running	102.4	150	-	1.6.78	30.6.83	- COUNCIL JET			L 151 7.6.78
11. Community Bureau of Reference	Running	2.70	7	3	1.1.76	31.12.78	- (covered by 10)	New proposal issued	COM (78) 309	L 74 20.3.76

Compiled by ESC Secretariat

SCHEDULE II.2

EUROPEAN COMMUNITY RESEARCH PROGRAMMES

PROGRAMME	STATUS	COST (EC BUDGET) (MUA)	EC STAFF	DURATION			ADVISORY COMMITTEES ON PROGRAMME MANAGEMENT	REMARKS	REFERENCES	
				YEARS	START	END			PROPOSAL	DECISION (O.J.)
INDIRECT ACTIONS (continuation)										
12. Footwear	Running	0 235	-	4	1.1.77	31.12.80	20 Footwear Industry Committee(*)	(*) different terms of ref.		L 61 5.3.77
13 Aeronautics	Running	36.7 (MEUA)	4	5	-	-	21. Aeronautical Construction - Management and coordination Committee(*)	(*) different terms of ref.	COM (77) 362	
14. Paper & Board Recycling	Running	2.9	2	3	1.1.78	31.12.80	22. ACPM "Paper & Board Recycling"			L 107 21.4.78
15 Uranium	Running	3.00	3	3	1.1.78	31.12.80	23. ACPM "R & D Uranium"			L 72 14.3.78
16 Primary Raw Materials	Running	18.00	8	4	1.1.78	31.12.81	24. ACPM "Primary Raw Materials"	Suggestion to merge members with 23 above		L 72 14.3.78
17 Secondary Raw Materials (Waste Recycling)	Proposal	13.00	6	4	-	-	25. ACPM "Urban and Industrial Waste Recycling"	Suggestion to merge members with 22 above	C 233 3.10.78	
18. Thermal Water Reactor Safety	Proposal	8.80	5	5	-	-	- (covered by 1)		C 146 21.6.78	
19. Fast Breeder Reactor Safety	Proposal	5.82	3	5	-	-	26 Fast Reactor Coord. Committee		C 233 3.10.78	
20. Decommissioning	Proposal	6.38	5	5	-	-	27 ACPM "Decommissioning"		C 146 21.6.78	
21 Scientific and technical training	Running	4.60	6	4	1.1.77	31.12.80	- - -			L 10 13.01.77
22. Forecasting and Assessment in the Science and Technology	Running	4.40	10	5	17.8.78	16.8.83	28. ACPM "FAST"			L 225 16.8.78
23 Climatology	Proposal	8.00	3	5	-	-	29. ACPM "Climatology"		COM (78) 408	

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SCHEDULE II.3

EUROPEAN COMMUNITY RESEARCH PROGRAMMES

PROJECT	STATUS	COST (EC BUDGET) (MEUA)	EC STAFF	DURATION			COMAC's	REMARKS	REFERENCES	
				YEARS	START	END			PROPOSAL	DECISION (O.J)
CONCERTED ACTIONS										
1 Medical - Congenital Abnormalities	Running	0.33		3	1 1 78	31 12 80	30. Registration of Congenital Abnormalities		L 52	23.2.78
2 Medical - Cellular Ageing	Running	0.4		4	1 1 78	31 12 81	31 Cellular Ageing		L 52	23.2.78
3 Medical - Extra-corporeal Oxygenation	Running	0.36		4	1.1.78	31 12 81	32. Extra corporeal oxygenation		L 52	23.2.78
4 Medical-attempted suicides	Proposal	2.70		4	-	-	33. Attempted Suicides		COM (78) 377	
5 Medical-thrombosis	Proposal		4	-	-	34. Thrombosis		COM (78) 377		
6. Medical-impaired hearing	Proposal		3	-	-	35 Impaired Hearing		COM (78) 377		
7. Medical-prenatal Monitoring	Proposal		4	-	-	36 Prenatal Monitoring		COM (78) 377		
8. Medical-electrocardiography	Proposal		4	-	-	37 Quantitative Electrocardiography		COM (78) 377		
9. Town Planning	Running	0.20		2	16.2.78	15.2.80	38 Urban Concentration		L 45	16.2.78

Compiled by ESC Secretariat

SCHEDULE II.3

EUROPEAN COMMUNITY RESEARCH PROGRAMMES

PROJECT	STATUS	COST (EC BUDGET) (MEUA)	EC STAFF	DURATION			COMAC's	REMARKS	REFERENCES	
				YEARS	START	END			PROPOSAL	DECISION (O.J.)
CONCERTED ACTIONS (continuation)										
10. Sewage Sludge	Running	0.14		3	19.10.77	18.10.80	39. Treatment and Use of Sewage Sludge		L 267	19.10.77
11. Air Pollution	Running	0.5	2	4	1979	1982	40. Physical-chemical behaviour of atmospheric pollutants	C 55	4.03.78	L 311 4.11.78
12. Water Pollution	Running	0.48	1	4	1979	1982	41. Organic micropolluants in water	C 54	3.03.78	L 311 4.11.78
13. Foodstuffs	Running	0.25		3	25.2.78	24.2.81	42. Effects of Processing on Physical Properties of Foodstuffs		L 54	25.2.78
14. Maize as a basic feed for Beef Production	Proposal	1.76	2	5	-	-	48. Maize for Beef Production	COM (78) 768		
15. The Production and Feeding of single cell protein	Proposal			5	-	-	49. Single cell protein	COM (78) 768		
16. Early weaning of piglets	Proposal			5	-	-	50. Early weaning of piglets	COM (78) 768		
17. Mineral Nutrition of Basic Food Crops	Proposal			5	-	-	51. Mineral Nutrition of Basic Food Crops	COM (78) 768		
18. Production of biosynthetic proteins (former Cost Project 83)	Proposal									

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SCHEDULE II.4

EUROPEAN COMMUNITY RESEARCH PROGRAMMES

PROJECT	STATUS	COST (EC BUDGET) (MUA)	EC STAFF	DURATION			PROJECT MANAGEMENT COMMITTEES	REMARKS	REFERENCES	
				YEARS	START	END			PROPOSAL	DECISION (O J)
COST PROJECTS										
11 European Informatics Network	Running	0.155		5	1 2.73	1 2.78	"European Informatics Network"			
50 Materials for Gas Turbines	Running	-		6	1 7.75	1 8.80	"Materials for Gas Turbines"			
70 European Centre for Medium Range Weather Forecasts	Running	-		-	-	-				
70 Devices for Electronic Traffic Aids	Running	-		3	31.8.77	31 3.80	"Electronic Traffic Aids"			
43 European Experimental Network of Ocean Stations	(*)			4	(*)	(*)	"Network of Ocean Stations"	(*) Agreement signed 15 12 77 Possible date of entry into force 3.79		
208 Technical and other problems raised by the optical fibre com- munication systems	Running			3	15.12.77	14.12.80	"Optical fibre"			
211 Redundancy reduction techniques in video telephone services	Running			3	31.3.77	30 3.80	"Video telephone services"			

SCHEDULE II.4

EUROPEAN COMMUNITY RESEARCH PROGRAMMES

PROJECT	STATUS	COST (EC BUDGET) (MUA)	EC STAFF	DURATION			PROJECT MANAGEMENT COMMITTEES	REMARKS	REFERENCES	
				YEARS	START	END			PROPOSAL	DECISION (O J)
COST PROJECTS (continuation)										
201 Methods of Optimization and Planning of Telecommunications Networks	Proposal				-	-		Working Group		
202. Digital techniques to be used in local telecommunications networks with a view to providing a comprehensive range of customer services and facilities	Proposal				-	-		Working Group		
46 Basic-line studies in coastal ecology	Proposal				-	-		Working Group		
47. Mariculture	Proposal				-	-		Working Group		
91. Effects of processing and distribution on quality and nutritive value of food	Proposal				-	-		Working Group		
53. Materials for seawater desalination plants	Proposal				23.11.71	Sept. 79	"Materials for desalination plants"			
72 Development and Standardisation of Meteorological Equipment	Proposal				-	-	Technical Sub-Committee on Development and Standardization of Meteorological Equipment			

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EUROPEAN COMMUNITY RESEARCH PROGRAMMES

ACTIONS	STATUS	COST (EC BUDGET) (MUA)	EC STAFF	DURATION			MANAGEMENT COMMITTEES	REMARKS	REFERENCES	
				YEARS	START	END			PROPOSAL	DECISION (O J)
MISCELLANEOUS ACTIONS										
1 Agriculture	Proposal	18 602		5	-	-	- (to be covered by SCAR)		COM (78) 301	
2 Data-processing - common projects (various studies)	Running	1.245	-	3	-	-	} Advisory Committee on joint Data Processing Projects			(various)
		420	-	4	-	-				
		200	-	1	-	-				
3 Technical anti-pollution campaign in the steel industry	Running	10	-	5	1973	1978	- (covered by CRC)	Based on Art 55 ECSC Treaty	C 92	6.8 74
4 Safety in mines	Running	7.5	-	5	1 1 77	31.12.81	- (covered by CRC)	"	C 10	14 1.77
5 Industrial hygiene in mines	Running	7 0	-	5	1 1 77	31.12.81	- (covered by CRC)	"	C 159	5.7 78
6 Scientific and technical information and documentation	Running	9.5	-	3	1 1 78	31 12.80	- (covered by CIDST)			L 311 4 11.78

SCHEDULE II.6

EUROPEAN COMMUNITY RESEARCH PROGRAMMES

ACTIONS	STATUS	COST (EC BUDGET)	EC STAFF	DURATION			MANAGEMENT COMMITTEES	REMARKS	REFERENCES			
				YEARS	START	END			PROPOSAL	DECISION (O J)		
DEMONSTRATION PROJECTS		(MEUA)										
1	Exploitation of geothermal fields	Running	22.5 (*)	-	5	-	1979	43. ACPM "Geothermal Projects"	Suggestion to overlap members with 15 above	COM (78) 122	Framework Regulation 1302/78 L 158 16.6.78	
2	Liquefaction and gasification of solid fuels	Running	50.0 (*)	-	5	-	1979	44. ACPM "Conversion of solid fuels"		COM (78) 122	Framework Regulation 1303/78 L 158 16.6.78	
3	Exploitation of solar energy	Running	22.5 (*)	-	5	-	1979	45 ACPM "Exploitation of solar energy"	Suggestion to overlap members with 4 above	COM (78) 511	Framework Regulation 1303/78 L 158 16.6.78	
4	Exploitation of wave, tidal and wind energy	no proposal yet	-	-	-	-	-	-		none yet	Framework Regulation 1303/78 L 158 16.6.78	
5	Energy saving	Running	55.0 (*)	-	-	-	1979	46 ACPM "Energy saving demonstration projects"	Suggestion to overlap members with 14		Framework Regulation 1303/78 L 158 16.6.78	
6	Technological development projects - Hydrocarbons	Running	(Annual financing 35 MEUA in 1978)				-					Regulation no. 3056/73 L 312 13 11 73

* Budget suggested by Council 21 12 78 approved subject to reservations of one Member State

SCHEDULE II 6

EUROPEAN COMMUNITY RESEARCH PROGRAMMES

ACTIONS	STATUS	COST (EC BUDGET) (MFUA)	EC STAFF	DURATION			MANAGEMENT COMMITTEES	REMARKS	REFERENCES	
				YEARS	START	END			PROPOSAL	DECISION (O.F.)
ENERGY EXPLORATION (continuation)										
1. Common Exploration projects Hydrocarbons	Proposal			3			47 ACPM "Hydrocarbon exploration projects"	Revised proposal amended	C 13 25 1 75 C 70 21 3 78 C 200 22 8 78	
2. Prospecting projects - Uranium	Running	(Annual financing 5 MEU A in 1978)						Art. 70 of Euratom Treaty		Regulation no 2014/76 L 221 14 8 76

(* Budget suggested by Council 21 12 78 approved subject to reservations of one Member State

Compiled by ESC Secretariat

SCHEDULE III

COMMISSION

COMMISSION DECISION

of 29 June 1978

establishing an Advisory Committee on
Industrial Research and Development⁽⁶⁾

(78/636/EEC)

THE COMMISSION OF THE EUROPEAN
COMMUNITIES,Having regard to the Treaty establishing the European
Economic Community,Having regard to the guidelines for a common policy in
the field of Science and Technology,Whereas the Commission intends to increase industrial
research during the next few years;Whereas industrial research and development affects
working conditions and employment,

HAS DECIDED AS FOLLOWS:

Article 1

1. There is hereby established, and attached to the Commission, an Advisory Committee on Industrial Research and Development, hereinafter referred to as "the Committee".

2. The Committee shall be composed of representatives of European organizations competent in the field of industrial research and development.

Article 2

Either at the Commission's request or on its own initiative, the Committee shall provide the Commission with opinions on all problems connected with the following matters:

- a) Aspects of research and development involving relations between the Commission and Community industry which are of a horizontal nature, in particular: the designing of Community policy on industrial research and development; improvement of the exchange of information between industry and the Commission on a reciprocal basis.
- b) Guidelines for the research and development programmes of industrial interest which the Commission might propose to the Council. The

Committee shall help to ensure appropriate contacts with Community federations of industry, where such contacts do not already exist.

- c) Research contract projects of industrial interest for which the Commission provides financial assistance⁽¹⁾.
- d) Research and development activity by European industries, useful for defining a common policy in the field of science and technology.

Article 3

- 1 The Committee shall comprise 25 members.
2. The seats shall be allocated as follows:
15 members of the Union of Industries of the European Community (UNICE)⁽²⁾, two each for Belgium, France, the Federal Republic of Germany, Italy, the Netherlands and the United Kingdom and one each for Denmark, Ireland and Luxembourg;
four members of the European Centre for Public Enterprise (ECPE)⁽³⁾;
three members of the Federation of European Industrial Cooperative Research Associations (FEICRO)⁽⁴⁾;
three members of the European Trade Union Confederation (ETUC)⁽⁵⁾.
3. Eight persons belonging to the following organizations may attend the Committee's meetings as observers:
three observers from the European Research and Development Committee (CERD) set up by the Commission on 14 February 1973;

(1) By virtue of the decision to be taken by the Council under the common science and technology policy (see Commission communication to the Council of 30.6.1977, OJ No 187, 5.8.1977).

(2) Address: 6, rue de Lozum, 1000 Brussels

(3) Address: 15, rue de la Charité, 1040 Brussels

(4) Address: 47, Victoria Street, London SW1H 0EQ

(5) Address: 37, rue Montagne aux Herbes Potagères, 1000 Brussels

(6) O.J. no L 203 of 27 July 1978.

one observer from the European Industrial Research Management Association (EIRMA)⁽¹⁾;
 one observer from the UNICE secretariat;
 one observer from the ECPE secretariat;
 one observer from the FEICRO secretariat;
 one observer from the ETUC secretariat.

Article 4

The members and observers of the Committee shall be appointed by the Commission after consultation with their respective organizations.

Article 5

The term of office of a Committee member and an observer shall be two years. It shall be renewable.

After expiry of the two year period, Committee members and observers shall remain in office until they have been replaced or their term has been renewed.

The appointment of a member or observer shall be terminated before the end of the two year period if such member or observer resigns, ceases to belong to the organization he represents, or dies. The appointment of a member or observer may also be terminated if the organization which proposed him as a candidate requests that he be replaced.

He shall be replaced for the remainder of his term in accordance with the procedure set out in Article 4.

His duties shall not entitle him to remuneration.

Article 6

The list of members and observers shall be published by the Commission for information purposes in the *Official Journal of the European Community*.

Article 7

After consulting the Commission, the Committee shall elect a chairman and a vice-chairman for a period of two years. Election shall be by a majority of two thirds of the members present.

The chairman shall prepare and organize the work of the Committee.

Article 8

The Committee may invite any person with special qualifications in respect of an item on the agenda to participate in its work as an expert.

Such experts shall participate only in the discussions of the items on account of which they were invited.

Article 9

The Committee may set up working parties.

Article 10

1. The Committee shall meet at Commission headquarters.

2. Representatives of the Commission departments concerned shall take part in meetings of the Committee and of its working parties.

3. The relevant departments of the Commission shall provide secretarial services for the Committee and its working parties.

Article 11

The Commission when requesting an opinion from the Committee may fix a date by which the opinion shall be delivered.

Article 12

Without prejudice to Article 214 of the Treaty, where the Commission informs the members of the Committee that an opinion requested or a question raised touches upon confidential matters, such members shall be under an obligation not to disclose information which has come to their knowledge through the work of the Committee or of its working parties.

In such cases only the members of the Committee and the representatives of the Commission departments concerned shall attend the meetings.

Article 13

This Decision shall enter into force on 29 June 1978

Done at Brussels, 29 June 1978.

For the Commission

Guido BRUNNER

Member of the Commission

⁽¹⁾ Address: 38, cours Albert Ie, 75008 Paris.

PART II

**RESEARCH AND DEVELOPMENT
IN THE MEMBER STATES OF THE COMMUNITY**

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BELGIUM/LUXEMBOURG

RESEARCH AND DEVELOPMENT - BELGIUM/LUXEMBOURG

1. Introduction

Expenditure on publicly-financed R & D in Belgium has risen as follows since 1975 (source: SPPS):

Year	Public expenditure on R & D Mio Bfrs.	% of Total Public Budget
1975	14,308	2.28
1976	17,382	2.42
1977	19,259	2.36
1978	20,584	2.15

Over this period, public expenditure on R & D accounted for approximately 2.3% of the total public budget and 0.7% of GDP.

A very small proportion of expenditure is devoted to defence research (only 0.3%). Otherwise, the structure of civilian R & D expenditure in Belgium closely follows the average trend for the Community as a whole (see SCHEDULE I).

In recent years an attempt has been made to increase the importance of R & D in the area of industrial productivity and technology. The percentage of the total expenditure on public R & D for Belgium (35.5% in Belgium) is higher than the European average (31.3% in 1977).

In 1977 civilian and military appropriations for industrial purposes in Belgium were running at 0.28% of GDP, whereas the Community average was 0.48%. The R & D budget for industrial research in Belgium is therefore relatively lower than in EEC Member States with a comparable economic structure.

In view of the country's small size, R & D in Belgium concentrates on projects aimed at economic and social development rather than big science. Strong emphasis is also placed on international cooperation in R & D. The aims of Belgian science policy have been defined as being:

- to secure an adequate level of resources compatible with budgetary means and national income;
- to rationalize the utilization that is being made of resources devoted to scientific activities. The priorities here are to reduce duplication in research programmes where it is deemed unnecessary, to coordinate work among research institutions and to harmonize Government legislation;
- to maintain the balance between university research and industrial and agricultural research;
- to give direction to the overall basic and applied research effort of the nation related to the needs of the science and the social, cultural and economic needs of the national community;

- to provide a system for the dissemination and availability of accumulated scientific and technical knowledge thus enabling the enquirer to have at his disposal the required information; to improve mutual information between industry and universities;
- the sixth implied in the preceding five, is to stimulate the industrial use of the results of research in the interests of the needs of society.

In recent years public expenditure on R & D was allocated as follows between the various implementing bodies (%)

	1977	1978	Forecasts for 1979
— University research	34.9	37.4	34.8
— Industrial and agricultural research (industry, public and private centres).	33.8	35.7	33.0
— Public service research	13.6	14.7	14.7
— International research	17.7	14.5	17.5

Between 1970 and 1979 total R & D appropriations rose by an annual 13.8% (in current prices); the corresponding figures for other areas were as follows: 11.8% for industrial and agricultural research, 14.7% for academic research and 19% for international scientific activity.

Growth in industrial and agricultural research lagged behind other R & D activities and in recent years Belgian science policy has been trying to restore the balance.

2. The Institutional Framework

Responsibility for carrying out R & D in Belgium, generally speaking lies with the sectoral ministries and the agencies which come under them. They are responsible for the management of scientific establishments and services, financing of research activities and the payment of research grants to the private sector. The possible risk of overcompartmentalization inherent in this system was however already recognized in the late 1950's. To counterbalance it, a comprehensive, collegiate structure for the central coordination of science policy and R & D and for the preparation of decisions and programming was set up in 1959 comprising the following:

- Science Policy and Programming Services (SPPS);
- Ministerial Committee for Science Policy (CMPS);
- Interministerial Committee for Science Policy (CIPS);
- National Science Policy Council (CNPS);

These bodies were placed under the authority of the Prime Minister and the Minister for Scientific Policy.

The organization and work of these bodies are described in the following sections.

Once R & D programmes and budgets have been fixed centrally, there are a considerable number of bodies involved in the carrying out of the R & D and in the subsequent utilization of its results. The most important of these, which are also described are:

- Government Scientific Institutions and Research Centres (public, semi-public and private (indirect action));
- the Foundations (indirect action);
- the Institute for the Encouragement of Scientific Research in Industry and Agriculture (IRSIA);
- Service for Prototypes;
- Industrial Promotion Office (OPI);
- Belgian Productivity Centre (OBAP). Since 1 January 1979, this Centre has been known as the Institute for the Improvement of Working Conditions — a public establishment under the Ministry of Labour.

3. Science Policy and Programming Services (SPPS)

The Science Policy and Programming Services (SPPS) is a specialized Government department which comes directly under the Prime Minister. It reports in the first instance to the Minister of Science Policy and Programming (minister without portfolio), its formal brief is to coordinate all aspects of scientific policy and to submit budgetary programmes to the CMPS as from June each year.

The SPPS is responsible for coordinating all aspects of Belgian science policy, including the drawing up, in conjunction with the ministries concerned, of the annual science budgetary programme. This budgetary programme is drafted on the basis of proposals from the ministries. The SPPS collects detailed information concerning the amount of such appropriations, the reasons for which they are proposed and the use to which they are put, grouping the relevant data by destinations, determining the possible choice for the Government as regards increasing, reducing or maintaining the appropriations, entering appropriations for new projects, etc.

This data is then submitted to the Interministerial Committee for Science Policy (CIPS). The Minister for Science Policy then draws up a preliminary draft science policy budget programme on the basis of the CIPS Report, in the light of priorities and taking account of the National Science Policy Committee (CNPS) recommendations. The preliminary draft programme is finally scrutinized by the Ministerial Committee for Science Policy (CMPS) and forwarded to Parliament where it is examined alternatively by the specialized Committee of one of the two Houses during the annual debate on the Prime Minister's Budget.

When the budget has been adopted the appropriations are allocated to the various ministries and to the institutes and agencies responsible for administering or implementing R & D work.

The SPPS provides secretarial back-up for the CNPS, the CIPS and the CMPS.

The SPPS has a special allowance of its own within the budget, to enable it to service national programmes to promote R & D programmes (appropriations: Bfr. 552 Mio. in 1977; Bfr. 759.8 Mio. in 1978), which are carried out on an interdepartmental basis, on the proposal of the SPPS and, under the coordination of the CIPS and the CMPS, cover:

- water problems, in particular the quality of water; (an area in which scientific findings to date could be used as a multi-disciplinary aid to government decision-making);
- the improvement of scientific and technical information and documentation (national STID programme);
- research into data-processing, including the regional data-processing programme;
- the identification of the basic social aspirations in the country and its regions;
- air pollution;
- energy;
- economy of waste and secondary raw materials.

The SPPS is also responsible for a number of other administrative tasks including:

- the collection of available data on projects carried out in technical research, the growth and use of appropriations, international comparisons;
- the provision of technical and administrative cooperation, with the assistance of the Defence Research Centre, for space research activities;
- the collection, codifying and processing of available data on university expansion as well as the compilation of basic studies and international comparisons enabling the Government and Parliament to fix, at the national level, the norms underlying legislation in this sphere and the relevant budget estimates;
- the carrying out of studies in the economics of science and preparation of statistics and publications;
- the carrying out of a survey of all scientific research units in the public and private sector every two years;
- carrying out of other administrative and secretarial tasks.

4. The Interministerial Committee for Science Policy (CIPS)

The Interministerial Committee for Science Policy (CIPS) coordinates preparation and implementation. It is composed of senior officials of the ministries concerned with science policy. Its membership comprises:

- The Secretary-General of the SPPS (Chairman);
- The Director-General of the Ministry of National Education and Culture and the officials of the Ministry for Economic Affairs who are responsible for scientific matters;
- eight members appointed respectively from the departments concerned by the Prime Minister, the Minister for Foreign Affairs, the Minister for Defence, the Minister for Finance, the Minister for Agriculture, the Minister for Construction, the Minister for Labour and Employment and the Minister for Health.

The work of the CIPS involves the preparation, coordination and implementation of Government decisions on science policy on the instructions of the CMPS for whom it acts as a kind of COREPER (see 6 below). It is active in all areas of science policy which involve more than one Government department. It selects the research areas which are to be the subject of the national programmes and carries out the budgeting functions already described.

5. The National Science Policy Council (CNPS)

The CNPS is an advisory body composed of representatives of the higher education institutions and economic and social groupings. It has a total of 34 members who are appointed in a personal capacity for a six-year period. It is made up of a chairman, 12 members nominated from the universities and other institutions of higher education and 21 members drawn from industry, the trades unions and scientific research institutes. In 1978 membership was as follows: 9 University rectors, 5 University professors, 2 research workers, 8 members of trade unions and federations, 5 members from industry and one from banking.

It has a small secretariat of its own, but otherwise has to rely on the SPPS for back-up services.

The specific tasks of the CNPS are to:

- provide accurate information and statistics about research activities in Belgium;
- define the role of technological research in the Government's overall industrial policy;
- devise a general programme of research development to include the human, natural and exact sciences and to specify the ways and means of carrying it out;
- specify how establishments of higher education shall be developed bearing in mind the importance of each branch of science to the country (define university strategy);
- examine the procedures for cooperation between industry and universities;
- to review the science budget and advise on its allocation;
- advise the government on participation in international research.

6. The Ministerial Committee for Science Policy (CMPS)

The CMPS combines decision-making and coordination roles on the basis of the preparatory work done by the CIPS, and draws up the Government's science policy and annual budget. The CMPS is chaired by the Prime Minister and includes the Ministers for Finance, Education, Economic Affairs, Agriculture, Health and Defence. The ultimate decision-making power at Government level remains with the Cabinet.

The CMPS is supposed to meet three times a year with the CNPS to discuss the broader aspects of science policy. It may also consult the Chairman of the CNPS in between these meetings, where necessary.

7. Government scientific institution and research centres

The research activities and institutions which come under the different ministries are listed in SCHEDULE II.

The Ministry of Education is responsible for the General Records Office, the Royal Observatory, the Royal Library, the Royal Institute of Natural Sciences, the Royal Museum of Central Africa, the Royal Meteorological Institute and the Royal Institute of Art Treasures. The two state universities of Ghent and Liège are entirely financed by the Ministry of Education while the independent universities of Brussels and Louvain receive large Government grants each year in addition to their own resources, which consist chiefly of income from capital assets.

The Ministry of Economic Affairs is responsible for the Centre for the Study of Nuclear Energy (CEN) at Mol (a sponsored body established under public law). It also covers the Central Laboratory, the Department of Metrology and the National Institute for Extractive Industries (INIEX) (a semi-public autonomous body).

The Ministry of Agriculture is responsible for the State Botanical Gardens, the Institute of Veterinary Research, two Government agricultural research centres at Ghent and Gembloux and about 20 agricultural research stations throughout the country. It is also responsible for the National School of Veterinary Research in Brussels.

The Ministry of the Interior sponsors a number of provincial and communal administrative services and there are various semi-official establishments involved in research work, analysis and quality control as part of their public service functions.

8. The Foundations

The Foundations are the main vehicle for Government financing of fundamental research in Belgium. The most important of these are:

- *The National Foundation for Scientific Research (FNRS)*. A body established under private law recognized as being of public utility and coming under the Ministry of Education. It is chiefly concerned with the allocation of individual research fellowships. The subsidies amount to about 10% of

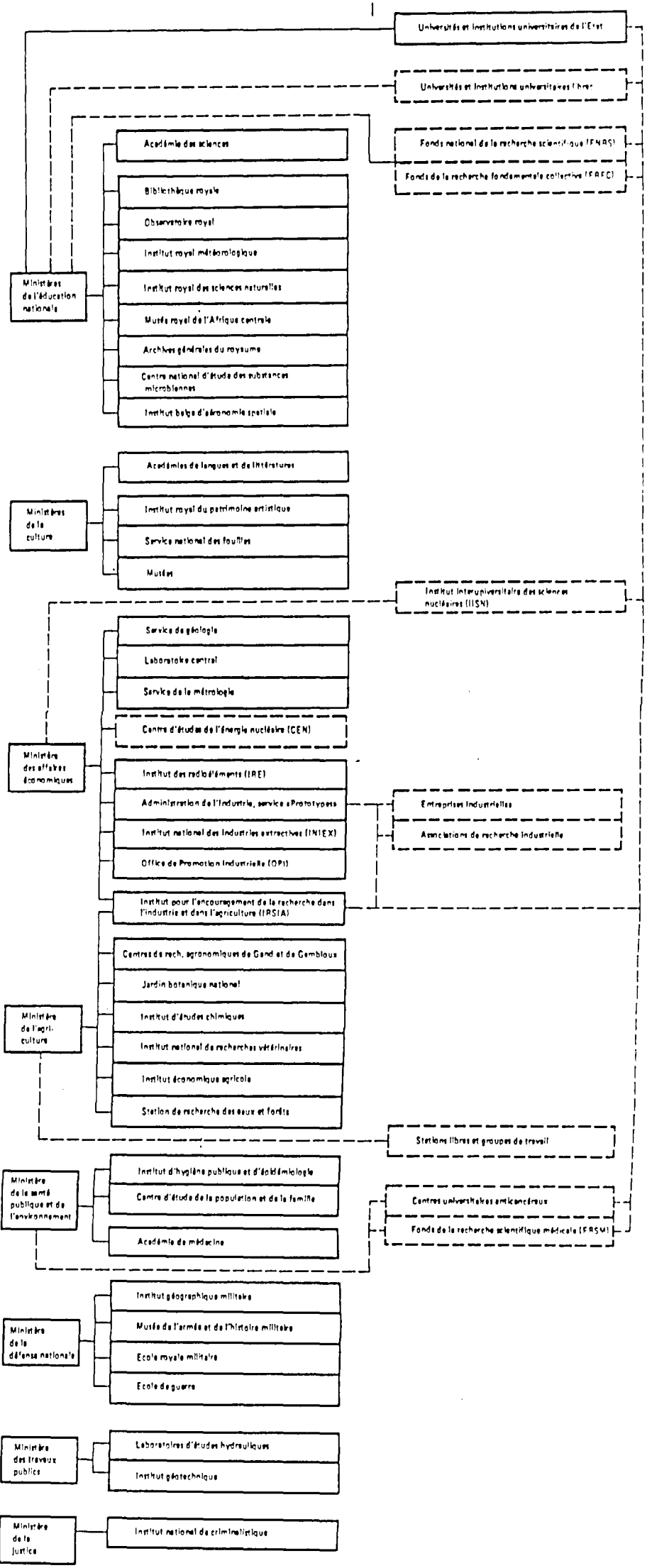
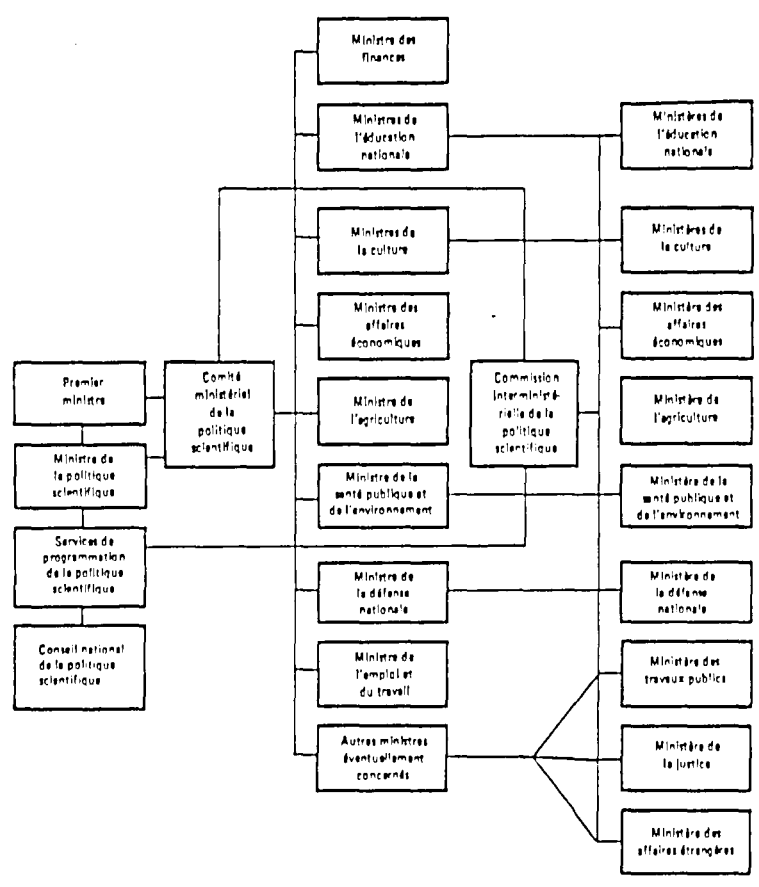
ZONE DU PARLEMENT

ZONE DU GOUVERNEMENT

ZONE DU CITOYEN ET DE LA COMMUNAUTE SCIENTIFIQUE

CHAMBRE
Commission des affaires générales et de la fonction publique

SENAT
Commission des affaires culturelles et de la politique scientifique



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Belgique
Politique scientifique et technologique nationale
- structures et mécanismes
1977
----- Relations administratives directes
- - - - - Relations administratives indirectes

DENMARK

RESEARCH AND DEVELOPMENT — DENMARK

1. Introduction

Public expenditure on research and development in Denmark in 1978 amounted to some 1,710 million Dkr. (244 million EUA). This is equivalent to about 0.6% of Gross Domestic Product. A large proportion (almost 60%) is devoted to the "general promotion of knowledge", about four-fifths of which is fundamental research. Most of the funds allocated to the remaining sectors may be regarded as supporting applied R & D. In these remaining sectors, the share of funds allocated to agricultural and public health R & D is higher than the average for the European Community as a whole. Energy conservation is being given increasing attention. Predictably, there is little emphasis on major science areas such as nuclear engineering and aviation. A breakdown of R & D expenditure by the principal objectives is given in SCHEDULE I.

2. The Institutional Framework

Traditionally the R & D sector in Denmark has mainly developed within the universities and other institutions of higher education. In addition considerable research is gradually taking place outside these institutions. The organizational structure associated with it has largely developed on an ad hoc basis (see SCHEDULE II). It was only with the passing of the Research Council's Act in 1968, that concerted efforts were made to achieve closer organizational unity. The 1972 Law on Research Councils and the Council for Scientific Policy set up a Research Administration body (Forskningssekretariatet), which is responsible for the administrative aspects of research.

3. Parliament

A permanent Parliamentary Committee on Science and Technology was set up in 1966/67. It comprises 17 members of the Folketing representing the different political parties. The Parliamentary Committee discusses science policy as a whole, and draft legislation in particular.

It also seeks, by means of a Contact Committee to establish contact between Parliament and research; the Contact Committee organizes meetings to which research workers and all members of Parliament are invited.

4. Government

Given the historical development of Danish research, there is no ministry with overall responsibility for science and technology policy. The largest number of bodies which carry out R & D come under the wing of the Ministry for Education. The Ministry for Agriculture, the Ministry for Trade and Industry, and the Ministry for the Interior also have important R & D responsibilities (see SCHEDULE III).

A degree of organizational unity in the administration of Government R & D is ensured by an administrative unit linked to the Ministry of Education. The unit is called the Danish Research Administration (Forskningssekretariatet). In this way the Ministry for Education carries out the functions of a research ministry, both nationally and internationally. It does not, however, have overall coordinating authority.

5. The Council for Scientific Policy and Planning (PRF)

The main advisory body responsible for the central supervision of public research in Denmark is the Council for Scientific Policy and Planning (Planlægningsrådet for Forskning) (PRF). The PRF, which is described in the next section, was set up by an Act in 1972, reforming the advisory system.

The PRF has 15 members appointed by the Minister for Education. The membership includes one representative, generally the Chairman, of each of the six individual research councils. One represents the Governing Board of the Atomic Research Establishment at Risø. The remaining eight are appointed in a personal capacity (academics, industrialists, trade unionists, etc.). Representatives of the different Government Ministries involved attend meetings as observers. The secretariat is provided by the Research Administration. The PRF meets about 9 times a year.

The PRF's main function is to ensure that research is geared to the needs of society and to advise Parliament in science policy matters, both in response to their request and on its own initiative. It is also the responsibility of the Council to make proposals on resources, structures, etc. required for the development of R & D, and to provide comprehensive R & D statistics and forecasts. The PRF also gives its opinion on the budget proposals of the individual Research Councils.

Since it has been set up the PRF has particularly concentrated on problems connected with the use of R & D for the benefit of society and from 1979 on long-term forecasting. It has also in different ways been involved with the institutions of higher education and the recruitment of research staff. The PRF has also been involved in framing general rules for contract research with universities and higher education institutes. On the more general level, the PRF is concerned with international cooperation on research. In addition it has been involved in a large number of research issues in the remaining public sector, for example in conjunction with the County Boroughs' Research Institute, the Institute for Research in the Border Region, the Danish Archives, etc.

Since 1974, the PRF has, in conjunction with the Research Councils run an Action Programme on R & D in specific fields which are of particular importance to society.

This Action Programme originally embraced the following areas:

- a) Analysis of and intensive research into Danish energy consumption patterns;
- b) Problems related to urban sprawl and urban renewal;
- c) Experimental work within the primary health services;
- d) Technological, health and social problems at the work-place in Denmark;
- e) Links between illness and social class;
- f) Drinking habits and attitudes in childhood and adolescence towards alcohol abuse;
- g) Analysis of the political institutions in Denmark;
- h) Value concepts and the development of the value system.

The PRF attaches particularly high priority to areas a-d. The Action Programme has been extended to include educational research and technological assessment has also been considered for inclusion.

In implementing the Programme the PRF is advised by an Action Programme Committee (Aktionsprogramudvalget — APU). Within the various fields of the programme a number of special standing committees have been set up in cooperation with the six Research Councils.

Apart from the APU, the PRF has a number of permanent or semi-permanent working groups under it. These include the Committee on International Research Cooperation, the Advisory Information Committee, the Committee on Forward Research, the Committee on Research Staff Recruitment Problems and the Cartographic Committee.

6. The six Research Councils

The six Research Councils are:

- SNF — Statens naturvidenskabelige Forskningsråd (Natural Science Research Council).
- SLF — Statens lægevidenskabelige Forskningsråd (Medical Research Council).
- SJVF — Statens jordbrugs- og veterinærvidenskabelige Forskningsråd (Agricultural and Veterinary Research Council).
- SSF — Statens samfundsvidenskabelige Forskningsråd (Social Science Research Council).
- SHF — Statens humanistiske Forskningsråd (Research Council for the Humanities).
- STVF — Statens teknisk-videnskabelige Forskningsråd (Research Council for Technology).

The task of the councils is to promote national research by:

- a) advising the authorities, especially on the public support of research, the exploitation of the results of research for the benefit of society and the education of research workers;

- b) following developments in both national and international research;
- c) financially supporting Danish research and Danish participation in international scientific cooperation;
- d) initiating research projects;
- e) coordinating the national research effort.

Each Council has 10 to 15 members appointed by the Ministry for Education, some of them in their personal capacity but the majority on the recommendation of higher education institutions, professional organizations and private associations. Secretarial services are again provided by the Research Administration.

The Councils are concerned with programmes which are prepared in connection with their medium-term budgets. Their short-term programmes are worked out every year in connection with the budget proposals of the Councils for the coming financial year. Budget proposals are forwarded to the Government and Parliament for discussion and to the PRF for its Opinion.

The budgets of the Research Councils for contracting their own R&D work are however relatively small. In 1977/78, it was proposed to allocate a total of 114 million Dkr. to the Councils, broken down as follows:

— Natural Science Research Council	28
— Medical Research Council	24
— Agricultural and Veterinary Research Council	13
— Social Science Research Council	14
— Research Council for the Humanities	14
— Research Council for Technology	19
— Computer Applications, etc.	2
TOTAL	114

7. Technology

The Technology Council (TR) was established in 1973 under the Ministry for Trade. The law on technological service specifies that the Council's role is (i) to monitor technological and industrial development and, on the basis of its findings, to consider, to advise or to take steps to promote technological development of benefit to Danish society and industry, (ii) to plan and coordinate society's contribution towards technological service activity, (iii) to monitor and support such activity and to supervise the way aid is spent and (iv) to take initiatives and tender advice to the authorities and other bodies in matters relating to technological service.

8. Other Bodies

There are a large number of bodies which are involved with R&D work and which receive Government support. The main bodies which are of interest here are:

- The Danish Academy of Technical Sciences;
- The Technological Institutes;
- The Fund for the Advancement of Industrial Research and Development.

The *Danish Academy of Technical Sciences* (Akademiet for de tekniske videnskaber), has about 20 organizations under it. These institutes, most of which cover a specific branch of industry or a specific technology, are financed mainly by contributions from private industry, by way of contracts for commissioned research. The Government, however, provides a subsidy through the Council for Technology covering approximately 20% of their total budget.

There are four *Technological Institutes*, two of which deal with all main types of industrial activities. The other two are specialized branch institutes. These private non-profit institutes, approved by the Ministry of Trade and Industry, are entitled to received financial aid, provided that their work is essentially aiming at the promotion of development in handicrafts and industry. On average, about 75% of the operating costs of the institutes are covered by the Government, the remaining 25% coming from fees for courses, consultative and experimental work.

In addition to the above, direct R&D assistance to industry is provided through the *Fund for the Advancement of Industrial Research and Development* (Udviklingsfondet) which was set up in 1970. The Fund can be used for:

- 1) Assistance in connection with R&D projects carried out by Danish industry;
- 2) Contracting for the development of new products, materials or production methods (development contracts);
- 3) Taking shares in Danish companies, the activities of which depend on development work (this has only been done once);
- 4) Dissemination of new technology and research results to industry.

The Fund had a budget of some 72 million Dkr. in 1975/76. Financial assistance mostly takes the form of part finance for R&D projects aimed at introducing new production capacity on production methods. Priority is given to projects where the Fund's assistance is considered to be of decisive importance.

9. Energy Research

Following the adoption in 1976 of a law on energy policy measures, all sectors having direct or overriding

energy policy objectives (including energy research) were grouped together under the Ministry of Trade. A council for energy planning and research (Energy Council) has been set up, one of its tasks being to assist the Ministry of Trade in devising programmes for energy research and development. In addition, an energy administration has been set up under the Ministry of Trade to handle administrative tasks in the energy sector (including those concerning energy research).

10. Agricultural R & D

In the Ministry of Agriculture there is a long tradition of creating research and experimental institutions, and close on two-thirds of public research in the agricultural sector is financed from the budget of the Ministry of Agriculture. The bulk of the rest of the agricultural and veterinary research is financed by the Ministry of Education through grants to the Royal Veterinary and Agricultural College (Den kgl. Veterinær- og Landbohøjskole) and the National Agricultural and Veterinary Research Council. There is very close cooperation between the College and certain research and experimental institutions financed by the Ministry of Agriculture.

11. Involvement in EEC Research

Questions related to Danish involvement in EEC research activities are discussed by an EEC specialized committee for science and research (EF-specialudvalget for videnskab og forskning) which is one of 23 such specialized committees set up under the EEC Committee (EF-udvalget), the main coordinating body for EEC questions which is composed of government officials.

COMMENTS

The decentralized organization of Danish applied public R & D has the advantage of ensuring that there is a close relationship between the user ministries and the R & D work being carried out. In this way, the R & D system is flexible in responding to changes in requirements.

At the same time, such decentralization carries the risk of favouring short-term applied R & D projects in specific sectors at the expense of longer-term projects with broad societal implications.

The central steering of Government R & D policy is hampered by the lack of a definite overall R & D budget. While the concept of an overall R & D budget has recently been given consideration, it has at the moment no real influence on the R & D decision-making process.

BIBLIOGRAPHY

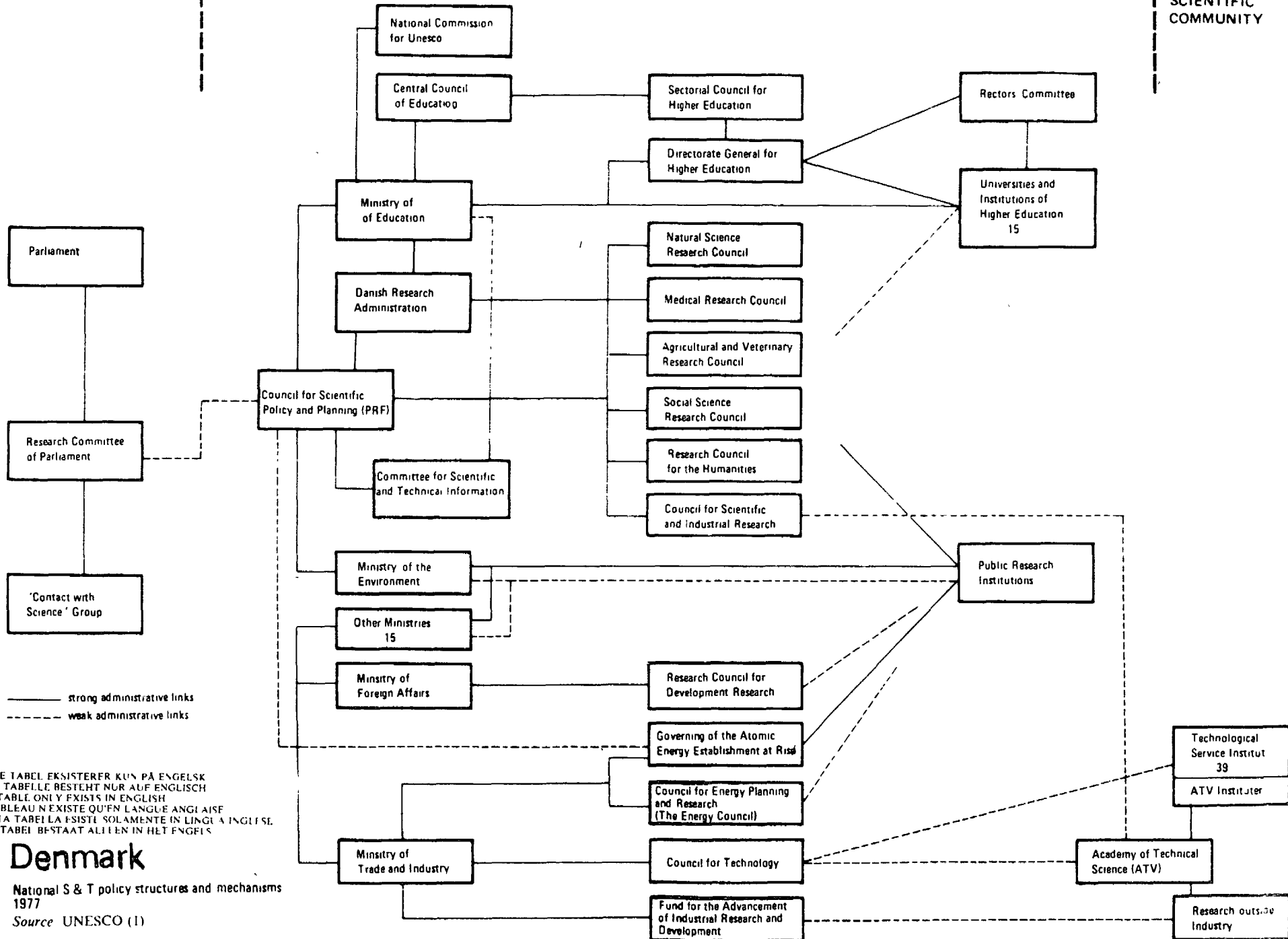
1. *Government Financing of Research and Development 1970-1978*, Statistical Office of the European Communities, Luxembourg 1978.
 2. FORBES, D.B., ed., *Guide to World Science, Vol. 7, Scandinavia*, Hodgson, London, 1975.
 3. Forskningssekretariatet, *Forskningsstatistik 1973, Sammenfattende statistisk oversigt over ressourceforbruget til forskning og udviklingsarbejde i Danmark 1973*, Copenhagen, 1976.
 4. Forskningssekretariatet, *Forskningsstatistik 1975, Erhverslivets forskning og udviklingsarbejde*, Copenhagen, 1977.
 5. Forskningssekretariatet, *Coordination of Research and Development in Denmark - Copenhagen, 1977* (Ref. EF-07-01) and miscellaneous papers.
 6. *Planlægningsrådet for Forskning - Statens 6 Forskningsråd, Beretning 1. april 1976-31. marts 1977*, Copenhagen, 1978.
 7. *National Science and Technology Policies in Europe and North American 1978 - Present State and Future Outlook*, Doc. UNESCO/MINESPOL II/5, to become No. 43 in series "Science Policy Studies and Documents", UNESCO, Paris 1979.
 8. The European Communities, Working Documents from the meeting at which national and Community policies were compared (COPOL 79), Brussels, 24 and 25 april 1979.
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SCHEDULE I

PUBLIC R & D EXPENDITURE IN DENMARK, 1978

Heading	M DKR.	Denmark. M EUA	%	EEC %
1. Exploration and Exploitation of the earth and its atmosphere	30.1	4.3	1.8	2.0
2. Planning of human environments	43.5	6.2	2.5	3.4
3. Protection and improvement of human health	142.3	20.3	8.3	5.4
4. Production, distribution and rational use of energy	117.3	16.7	6.8	11.6
5. Agricultural productivity and technology	148.8	21.2	8.7	3.7
6. Industrial productivity and technology	94.7	13.5	5.5	8.2
7. Social and sociological problems	63.7	9.1	3.7	3.2
8. Exploration and exploitation of space	62.6	8.9	3.7	4.4
9. Defence	13.3	1.9	0.8	22.3
10. General Promotion of Knowledge	996.7	142.3	58.2	35.5
Not itemised	-	-	-	0.3
TOTAL	1,713.0	244.5	100.0	100.0

Source: Statistical Office of the European Communities (1).



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 QUESTA TABELLA ESISTE SOLAMENTE IN LINGUA INGLESE
 DEZE TABEL BESTAAT ALLEEN IN HET ENGELS

Denmark

National S & T policy structures and mechanisms
 1977

Source UNESCO (1)

SCHEDULE III

PUBLIC RESEARCH INSTITUTES WITHIN SPECIFIC FIELDS

Ministry of Trade

The *Research Establishment at Risø*, is the main research institution of this group. Its total operating costs amounted to 110 million Dkr. in the financial year 1975-1976.

The Research Establishment carries out research, development and advisory work relevant to the application and supervision of energy, including the use of atomic energy for peaceful purposes. The Establishment's operational budget for the 1979 Financial Year was Dkr. 134.7 million.

Ministry of Agriculture

A large number of research institutions and laboratories in the agricultural and veterinary sciences are financed by this Ministry, the most important being the following: the *Government Research in Animal Husbandry* (Statens Husdyrbrugsforsøg), the *Government Crop Husbandry Service* (Statens Forsøgsvirksomhed i Plantenkulture), the *Government Dairy Research Institute* (Statens Forsøgsmejeri), the *Government Pest Infestation Laboratory* (Statens Skadedyrslaboratorium), the *Government Seed Testing Station* (Statsfrøkontrollen), the *Institute of Farm Management and Agricultural Economics* (Landøkonomisk Driftsbureau), *Agricultural Technical Research* (De landbrugstekniske Undersøgelser), the *Government Testing Station for Farm Machinery* (Statens redskabssprøver), the *Danish Forest Experiment Station*, (Statens forstlige forsøgsvæsen), the *Government Veterinary Serum Laboratory* (Statens veterinære Serumlaboratorium), the *Government Veterinary Institute for Virus Research* (Statens veterinære institut for virusforsøg), the *Poultry Research Laboratory* (Laboratoriet for fjerkræundersøgelser), and the *Danish Meat Product Laboratory* (Slagteri- og konserverlaboratoriet).

Ministry of Cultural Affairs

The *National Museum* (Nationalmuseet), the *University Libraries*, the *Record Office* (Rigsarkivet), the *regional archives and the Archive for Trade and Industry* (Erhvervsarkivet) are among the most essential institutions with R & D activities under this Ministry.

Ministry of the Interior

Research is carried out by the *State Serum Institute* (Statens Seruminstitut) and in *State* as well as *county* and *municipal* hospitals, which to a great extent are supported financially by the Ministry.

Ministry of Defence

The civil research effort of this Ministry takes place in the *Institute of Meteorology* (Meteorologisk Institut) carrying out research in the fields of meteorology and geophysics and in the *Institute of Geodesy* (Geodætisk Institut) being responsible for geodetic and seismic research activities.

Other Ministeries

Several other ministries initiate and finance R & D related to their activities within specialized institutes and laboratories. The most important of these are:

- Ministry of Social Affairs: The *Institute of Social Research* (Socialforskningsinstitutet).
- Ministry of Housing: The *State Institute of Building Research* (Statens Byggeforskningsinstitut).
- Ministry of Transport and Communications: The *State Road Laboratory* (Statens Vejlaboratorium).
- Ministry of Economic Affairs: The *National Bureau of Statistics* (Danmarks Statistik).
- Ministry of Fisheries: The *Danish Institute for Fishing and Sea Investigations* (Danmarks Fiskeri- og Havundersøgelser) and the *Research Laboratory of the Ministry of Fisheries* (Fiskeministeriets Forsøgslaboratorium).
- Ministry for Greenland: The *Institute for Geological Investigations in Greenland* (Grønlands Geologiske Undersøgelse).
- Ministry of Justice: The *Council for Road Safety Research* (Rådet for trafikikkerhedsforskning).
- Ministry of Environmental Protection: The *Institute of Geological Investigations in Denmark* (Danmarks geologisk Undersøgelse).
The *State Food Institute*
The *Fresh Water Laboratory*.

FEDERAL REPUBLIC OF GERMANY

RESEARCH AND DEVELOPMENT — FEDERAL REPUBLIC OF GERMANY

1 Introduction

In 1978, Government expenditure on R & D in the Federal Republic of Germany reached DM 14,100 million; of this sum DM 8,500 million was provided by the Federal Government and DM 5,600 million by the Länder (States). The allocation of resources to research is somewhat above the Community average (0.95% of GDP). In absolute terms, the Federal Republic accounts for about one third of all Government-financed R & D in the Community. Expenditure grew rapidly in the period up to 1973, with lower growth being experienced thereafter. With the exception of general research promotion ⁽¹⁾ the pattern of research expenditure over the different objectives conforms closely to the Community average: in the Netherlands, Belgium, Denmark and Italy, however, a significantly larger proportion (45-47%) is devoted to general promotion of research. Defence research, on the other hand, only accounts for 12.5% of the total. There have been increases in recent years in the funds allocated to energy (12 and 13%) and health (5.2 and 5.0%).

A breakdown of Government R & D expenditure under the major headings is provided in SCHEDULE I.

2. The Institutional Framework

The organizational arrangements for research are strongly influenced by the federal structure of the

country. The 1949 Constitution lays down certain responsibilities for the Federal Government. Where there are no provisions to the contrary, other tasks are the responsibility of the individual Länder. In practice, the Federal authorities are responsible primarily for the promotion of research in non-university institutes and in industrial firms — and at international level — while schools and institutes of higher education are largely financed by the Länder. In this way both the Federal Government and the Länder participate in the promotion of research.

Historically, there has been strong emphasis on fundamental research ("science for science's sake"). The 1949 Constitution enshrines the principle that the arts, science and humanities, research and teaching are free. To promote applied research in pursuit of specific Government policy objectives, the Federal Government introduced additional research promotion programmes. This growing emphasis on applied R & D, combined with the increasing costs of funding research work, has led to a progressive strengthening of the Federal Government's role over the years.

The following table gives a breakdown of R & D expenditure between the Federal Government and the Länder; the figures are in DM '000 million:

	1977	1978	
— <i>financed by the Federal Government</i>	7.3	8.55	
- non-university research bodies		3.5	4.01
- private sector industry		3.3	3.60
- establishments of higher education		0.5	0.94
— <i>financed by the Länder</i>	6.0	5.64	
- non university research bodies		1.3	1.34
- private-sector industry		-	0.05
- establishments of higher education		4.7	4.25
Total ⁽²⁾	13.3	14.19	

Source. (16)

⁽¹⁾, i.e. in the main promotion of the major independently administered organizations for fundamental research, e.g. the Max-Planck-Gesellschaft.

⁽²⁾ These figures given by the Federal Ministry for Research and Technology in Federal Research Report VI are not exactly comparable with the ITC statistics contained in Schedule I

The apportionment of costs between the Federal Government and the Länder is only defined in outline. On 28 November 1975 the parties signed an outline agreement on the joint financing of research. This agreement regulated the following activities: co-operation in the joint financing of research, coordination of planning and decisions concerning the research policy of the Federal Government and the Länder, and the two-way flow of information. Provision for such cooperation is made already in Article 91(b) of the Constitution, which reads as follows:

“The Federal Government and the Länder may, on the basis of agreements, cooperate in educational planning and in the promotion of establishments and projects for scientific research of supraregional importance. The apportionment of the costs shall be laid down in the agreements”.

The content and form of this cooperation were laid down comprehensively and exclusively in the outline agreement of 28 November 1975 and in the implementing agreements of 28 October 1976, 17 December 1976 and 5 May 1977.

The following are not covered by the outline agreement and are therefore not jointly financed:

- Research Institutes and projects connected with the research of the individual ministries (departmental research: specific projects and establishments), i.e. research work farmed out by federal and Land ministries and intended to help these ministries in their decision-making for the implementation of their plans;
- research in industry;
- research projects costing less than DM 500,000 per year.

Coordination is in general ensured by the Federal Government/Länder Commission for Educational Planning and Promotion of Research (BLK), which was set up in 1970 as a permanent body for coordination of all joint matters relating to research at establishments of higher education and the financing of research. (See also 6).

The Länder themselves coordinate their activities through the Permanent Conference of Ministers of Education and Cultural Affairs (Ständige Konferenz der Kulturminister in der Bundesrepublik Deutschland) (KMK), a body set up in 1948 and comprising the 11 Land Ministers.

From the administrative point of view, the most important ministries concerned with R & D at federal level are the following:

	% of R & D (civil and military)		
	(1976)	(1977)	(1978)
Federal Ministry for Research and Technology	55.5	55.8	56.6
Federal Ministry of Economic Affairs	6.7	5.4	6.9
Federal Ministry of the Interior	1.7	1.9	2.0
Federal Ministry of Defence	22.7	22.1	20.6
Federal Ministry of Education and Science	5.7	6.0	5.7
Other federal ministries	7.7	8.8	8.2

Source: Federal Ministry for Research and Technology (16)

Defence research is the sole responsibility of the Federal Ministry of Defence.

R & D expenditure can also be broken down according to research objectives. The Federal Governments' research activities are divided as follows:

- promotion of federal research and technology programmes (1978: DM 4,300 million, i.e. 52%); examples: energy, space, transport, etc.;
- research activities of the individual ministries (departmental research) (1978: DM 3,000 million, i.e. 36%); These are projects in the areas of defence, public health, etc.;
- general research (DM 1,000 million, i.e. 12%).

In the Länder departmental research accounts for only 12% (DM 600 million) of total R & D expenditure.

In recent years increasing importance has been attached to the financing of clear-cut projects aimed at direct applications (project promotion).

These research activities are carried out with proportional financial support from the research institutes or industry proposing the programmes. This system allows better utilization of research staff and provides a stimulus for the institutes on account of the competition.

Research promotion agencies and foundations play an important role in the German system. The most important of these is the Deutsche Forschungsgemeinschaft (DFG), which is publicly funded and concentrates primarily on R & D in the higher education sector. Mention should also be made of important foundations (some of which are privately-funded), such as the Alexander von Humboldt-Stiftung, the Stiftung Volkswagenwerk, the Fritz

Thyssen-Stiftung. Some of these foundations are also active in the area of economic and social policy.

The main bodies which carry out Government-funded research are:

- the Major Research Establishments;
- the Max-Planck-Gesellschaft;
- the Fraunhofer-Gesellschaft;
- the Federal research institutes;
- the Land research institutes.

Some of these are briefly described in the later sections.

A summary of the principal bodies involved in research in the Federal Republic is provided in

Schedule II.

3. Research Planning

The Federal Government has four overall research policy aims:

- to develop and deepen scientific knowledge;
- to increase industry's productivity and competitiveness;
- to improve living and working conditions,
- to maintain external security.

These objectives are, in turn, reflected in the 13 priority areas shown in the following table:

The Federal Government's Research and Technology Policy — Aims and Priority Areas

Aims in promoting research and technology	Priority areas in the promotion of research and technology	Federal R & D expenditure in 1979 in DM million
Expansion of scientific knowledge	General research promotion and fundamental research	1 509.6
	Educational and vocational training research	171.3
	Information and documentation	93.7
	Safeguarding energy and raw materials supplies	2 128.5
Increasing industry's productivity and competitiveness	Information technologies and technical communications	459.0
	Electronics, other key technologies, innovation	550.4
Conservation of resources and preservation of natural living conditions	Space research and space technology	644.0
	Research and development in the health sphere	282.2
	Research and development in the nutrition sphere	235.0
Improvement of living and working conditions	Humanization of working life	103.4
	Environmental management	483.4
	Transport and traffic technologies	682.1
Improvement of knowledge of the chances and risks inherent in technology	Maintenance of external security	1 728.0

Source: (16)

In each of these 13 fields, there are one or more individual programmes coordinated by the various ministries responsible.

There is no "research budget" as such. Each ministry submits its budget requests to the Ministry of Finance. These are incorporated in the federal general annual budget, which is submitted to the Budgetary Committee of Parliament and Parliament itself by the Cabinet. The procedure at Land level is similar, with the establishments of higher education submitting requests to the respective ministries of education.

4. Federal Ministry for Research and Technology

The Federal Ministry for Research and Technology (Bundesministerium für Forschung und Technologie) (BMFT) was set up in 1972; it is an offshoot of the Federal Ministry for Education and Science (Bundesministerium für Bildung und Wissenschaft) (BMBW), which in turn was the successor of the Federal Ministry for Nuclear Energy (Bundesministerium für Atomwirtschaft) founded in 1955. The Federal Ministry for Education and Science is responsible for all matters concerning education, educational planning and

educational research, as well as for the Deutsche Forschungsgemeinschaft (German Research Society) (DFG).

The Federal Ministry for Research and Technology, on the other hand, is responsible for:

- general research promotion (with the exception of the DFG and SFB);
- planning and coordination of research;
- promotion of R & D in the sphere of the natural sciences and technology, particularly with a view to increasing industry's international competitiveness, safeguarding raw materials supplies, and protecting the environment, as well as promotion in the area of medicine and health care and the humanization of working life;
- basic questions and coordination in communications technology;
- promotion of data processing and information and documentation; coordination of the supply of information;
- matters concerning nuclear research and nuclear technology for peaceful purposes; reactor safety research; energy research and energy technology;
- promotion of space and marine research, as well as R & D on surface transport and traffic for public utility technologies; promotion of aviation research within the sphere of competence of the Federal Ministry for Research and Technology; coordination of civil and military aerospace R & D.

With a staff of over 550 and about 83% of the federal annual civil R & D budget (56.6% of the total R & D budget), the Federal Ministry for Research and Technology is the central administrative body in German research. The 11 major research establishments, the Max-Planck-Gesellschaft and the Fraunhofer-Gesellschaft as well as a number of smaller research centres come under its aegis.

The Federal Ministry for Research and Technology is also responsible for federal financial support for industrial R & D.

The Federal Ministry for Research and Technology is headed by the Minister, a Parliamentary State Secretary and a Permanent State Secretary. It comprises the following five departments:

- a) Administration, research policy, finance, basic questions concerning research establishments;
- b) General research promotion, coordination of research, international cooperation;
- c) Energy, raw materials and production engineering, biology, ecology and medicine;
- d) Data processing, electronics, information and communications;
- e) Space and transport systems.

5. Bodies advising the Federal Ministry for Research and Technology

The Federal Ministry for Research and Technology has at its disposal an extensive advisory system comprising over 1100 experts, who provide their services free of charge. (A survey is given in the Ministry's annual advisory plan).

They are at present organized in expert groups (Sachverständigenkreise) comprising up to 24 members, who are appointed for a three-year period. They provide advice on applications for financial support in their area of responsibility and consider long-term problems of a complex nature.

Finally, there is a much larger number of ad hoc committees, which are set up for a one-year period in order to prepare expert opinions on specific issues. In 1978, the total of 128 expert groups and ad hoc committees was broken down as follows:

Area of activity	Bodies	Advisers
Staff discussions and staff assessment in major research establishments	1	11
Research in the area of the social sciences	1	14
Fundamental research in the area of the natural sciences	9	96
Data processing	7	80
Marine research and marine technology	2	21
Energy research and energy technology	10	90
Humanization of working life	12	145
Information and documentation	18	202
Electronics	5	25
Space research and space technology	8	56
Technology in the service of health, nutrition and the environment	25	167
Raw materials research	7	66
Key areas of technology (physical and chemical technology, materials)	8	45
Transport and traffic systems	4	42
Technical communications	4	26
Public utility technologies	3	48
Aviation research and technology	2	12
Project committees	2	22
TOTALS	128	1 168

6. Federal Government/Länder Commission for Educational Planning and Promotion of Research

The Federal Government/Länder Commission for Educational Planning and Promotion of Research (BLK) was established in 1970 as the result of an agreement between the Federal Government and the Länder. It consists of 7 representatives of the Federal Government and two representatives of each Land government. The first group has 11 votes (given unanimously) while the second has one vote per member (given individually). Decisions require a three-quarters majority of members' votes. In addition, up to three representatives of the German Federal Council, the Science Council, the Federal Union of Local Authority Associations and the Federal Committee for Vocational Training attend in a consultative capacity.

The Commission acts as a permanent forum for the discussion of all questions on the promotion of education and research that are of common interest to the Federal Government and the Länder. The main tasks of the Commission are:

- to prepare a long-term overall plan for education;
- to draw up a budget for education policy, including expenditure on general research promotion;
- to work out plans for the implementation of education policy aims.

The Commission has four committees dealing with educational planning, the education budget, innovation in education and the promotion of research. Some of these in turn have a number of working groups.

7. The Permanent Conference of Land Ministers of Education and Cultural Affairs (KMK)

The Permanent Conference of Land Ministers of Education and Cultural Affairs (KMK) was set up in 1948 as an instrument for coordination and consultation between the Länder in the field of general culture, education and science policy. In the research field, it is primarily concerned with fundamental R & D in the higher education sector.

The Permanent Conference is made up of 11 ministers (or senators) from the Länder. In order to respect the autonomy of each Land, the Permanent Conference adopts policy recommendations on the basis of a unanimous vote. These recommendations are then implemented by government order in each Land.

8. The Science Council

The Science Council (Wissenschaftsrat) (W.R.) was established in 1957 by an administrative agreement between the Federal and the Land governments. It acts as the central advisory body for the coordination of science policy in universities and State research establishments (except for departmental research). It does not deal with the promotion of industrial research. It has a general assembly of 39 members formed by two committees: an administrative committee with 17 members and a scientific committee made up of 22 members. The administrative committee consists of 6

members nominated by the Federal Government (who have 11 votes given unanimously) and 11 delegates from the Länder (who have 11 votes given individually).

The members of the scientific committee are appointed; the composition is as follows: 16 scientists appointed by the Federal President on the joint recommendation of the DFG, the MPG, the AGF and the West German University Rectors' Conference, plus 6 leading public figures appointed on the joint recommendation of the Federal and the Land governments. The Council issues recommendations, which have to be adopted by a two-thirds majority in the general assembly. While these recommendations are not legally binding, they generally carry considerable weight with the Federal and the Land governments.

The task of the Science Council is to advise the Federal and the Land governments in the field of science policy. Provision is made for the following in the administrative agreement and the law for promoting the building of universities:

- Drafting of recommendations for developing higher education, science and research in terms of content and structure, in keeping with the requirements of social, cultural and economic life;
- Tasks under the law for promoting the building of universities, etc.;
- Expert opinions on the development of higher education, science and research at the request of a Land, the Federal Government or the Federal Government/Länder Commission.

A volume containing the Council's recommendations and opinions is published each year (4).

9. Research Promotion Establishments

The Deutsche Forschungsgemeinschaft (DFG) (German Research Society)

The DFG, which dates from 1920, is the main research promotion establishment. It promotes science in all branches through:

- financial support for research projects;
- encouragement of cooperation between researchers;
- support for the training of young scientists

It also advises Parliament and the different authorities, and maintains contacts with other public and private research bodies. It fosters the link between research and industrial activity as well as the relationship of German research to international science.

Membership of the DFG is open to higher education establishments and other bodies engaged in general research. In 1978, its membership comprised 45 universities and higher education establishments, 5 science academies and 15 research establishments and scientific associations. These form the general assembly, which determines the broad lines of activity and elects an executive committee and a senate. The executive committee, which looks after day-to-day affairs, is composed of a president and several vice-presidents elected for a three-year term, a secretary-general and

the President of the Stifterverband für die deutsche Wissenschaft (Donors' Association for the Promotion of Science).

The central governing body is the senate, whose task it is to coordinate the DFG's scientific activities, provide advice to government bodies and look after the interests of German science in international relations. The senate is composed of 33 researchers, 30 of whom are elected for a three-year term by the general assembly, the remaining 3 being appointed ex-officio. The DFG also has a board of trustees, which is composed of the members of the senate, plus 7 representatives of the Federal Government, 11 representatives of the Land Governments and 5 from the Stifterverband für die deutsche Wissenschaft. The board of trustees looks after financial questions and adopts the budget. One of the senate's numerous committees deals with questions relating to applied research in order to promote cooperation between industry, public administration and the scientific community.

Although the DFG is a self-governing body registered under private law, its funds come largely from public sources. The Federal Government and the Länder support the DFG's work in the general promotion of science in equal shares. In practice each provides 49% of the total, with the remaining 2% coming from contributions from different foundations and other revenue. The special research areas, on the other hand, (described below), are funded 75% by the Federal Government and 25% by the Länder.

The DFG does not have its own research establishments but has supported the foundation and expansion of numerous establishments. There are, moreover, training and research scholarships for young scientists. The principal financial support instruments and procedures are:

a) *The standard procedure* (1978: approximately 41.5% of DFG funds).

Under the standard procedure each researcher can obtain funds for his own research projects without being subjected to DFG influence as to content. This procedure leaves individual researchers ample scope for initiative and creativity. Projects are subject only to a generally written assessment procedure (generally a panel comprising two selected technical experts and the specialist committee chairman). The standard procedure facilitates early identification of new pointers for main point of effort programmes, researcher groups and, possibly, special research areas. Approval is given by the DFG's central committee, which is composed of 15 scientific members of the senate plus six representatives of the Federal Government and six representatives of the Länder.

b) *The main point of effort procedure* (1978: approximately 15.9% of DFG funds).

Under this procedure researchers from different establishments cooperate at supraregional level for a limited period (generally five years) within the framework of a main point of effort programme. The decision to draw up a main point of effort

programme is taken by the senate; the individual applications are coordinated, assessed as in the standard procedure and then approved by the central committee.

c) *Researcher groups* (1978, approximately 2.5% of DFG resources).

Researcher groups are medium-term associations of small numbers of scientists — generally at local or regional level — who cooperate on particularly innovation-oriented areas generally touching on several disciplines. Researcher groups are also structural promotion instruments which can pave the way for the formation of local points of effort.

d) *Special research areas* (1978: approximately 32.1% of DFG funds).

Special research areas are long-term local or regional projects on which research is concentrated. One or more university level bodies are involved, frequently in conjunction with non-university research institutions. They serve to promote (a) cooperation, particularly in order to overcome disciplinary and institutional barriers, and (b) the concentration of effort in local centres.

e) *Infrastructure.*

By promoting libraries, financing computers and major equipment projects, establishing ancillary research institutes, the DFG seeks to build up and maintain the infrastructure needed for research

The Stiftung Volkswagenwerk (SVW) (Volkswagenwerk Foundation)

The SVW was set up in 1961 following an agreement concluded in 1959 between the Federal government and the Land of Lower Saxony on the de-nationalization of the Volkswagenwerk. The proceeds from the sale of shares to the public form the SVW's basic capital, which amounts to roughly DM 1,000 million. This, together with a part of the profits of Volkswagenwerk, provides the SVW's finance. 25% of the funds at the SVW's disposal must be spent on scientific projects of scientific establishments in the Land of Lower Saxony. The remainder is spent in the other Länder according to a fixed formula. Since the SVW is not subject to Government budgetary provisions, it can use its funds flexibly.

The aims of the SVW are to promote science and technology in research and education, particularly in the form of initiatives on subjects and areas which are not covered, or are not covered adequately, by the other research promotion establishments. The SVW therefore tries to coordinate its activities with those of the public authorities.

The SVW supports research activities within the framework of selected priorities covering a wide range of subjects. The programmes have changed appreciably in recent years (e.g. work on educational research and biomedical engineering has now been completed and historical, cultural and social science subjects have been added). The programmes will continue to be developed in line with requirements. Apart from the subject- or problem-oriented focal points, some support is also

given to non-specific research. Applications from abroad are only accepted if there is some indication of cooperation with scientific establishments or scientists in the Federal Republic.

The Arbeitsgemeinschaft Industrieller Forschungsvereinigungen e.V. (AIF) (Confederation of Industrial Research Organizations)

The AIF was established in 1954. It is an umbrella organization of industry's research organizations and its member associations represent almost all branches of German industry. Its purpose is to promote joint R&D by small and medium-sized companies of Germany's industrial and handicraft sectors.

It has a membership of some 80 research associations and over 30 industrial organizations, which have 63 research institutes of their own. About 150 further institutes are associated with the research work sponsored by the AIF.

The AIF is funded by contributions from industry as well as a grant from the Federal Government. In 1978, the AIF had a total budget of DM 250 million, of which some DM 56.5 million was provided by the Federal Ministry of Economic Affairs.

With the assistance of an expert group and a grant committee, the AIF examines research projects submitted by its members; authorization subsidies are distributed by an authorization committee, comprising scientists and representatives of the Federal Government, the Länder and industry. The results of the research work must be published.

The Stifterverband für die Deutsche Wissenschaft (Donors' Association for the Promotion of Science)

The Stifterverband für die Deutsche Wissenschaft e.V. (SV) was established in the 1920's. The SV does not have a large basic capital of its own, but received its funds from members' fees, contributions from sponsors, donations and endowment funds. It has an annual budget of about DM 50 million.

The purpose of the SV is to promote science and technology (through research and theoretical studies) and help young scientists and engineers. It does so by making blanket grants to autonomous scientific bodies such as the Deutsche Forschungsgemeinschaft and the Max-Planck-Gesellschaft.

Other Foundations

There are a considerable number of smaller foundations engaged in research promotion.

10. Bodies carrying out research —

The Major Research Establishments —

The major research establishments (Grossforschungseinrichtungen des Bundes und der Länder), of which there are currently 12, were set up in the post-war

period to carry out research outside the higher education sector. They are constituted as legally independent bodies but are publicly financed, with 90% coming from the Federal Government and 10% from the Länder. In 1978, they had an aggregate budget of DM 1,530 million and a total staff of approximately 16,000, of which 4,400 were scientific staff. They thus account for the largest block of non-university research.

A summary of the principal data relating to the 12 major research establishments is provided in SCHE-DULE III.

The major research establishments were generally set up to tackle specific areas such as nuclear research, aerospace research and data processing, which require long-term planning, expensive equipment and a large multi-disciplinary staff; this research entails a high risk regarding ultimate commercial utilization but is in the interest of the industry and the general public.

The Government ensures that the work is geared to overall economic and social objectives, both in the provision of finance and in the description of each establishment's task.

The Government sets the broad research objectives of the establishments, coordinates their work and ensures effective evaluation and the efficient use of public funds. On the other hand, the decisive influence in scientific and technical questions is left in the hands of scientists. In 1971, the Government laid down revised guidelines concerning structural and organizational questions, the participation of scientific personnel in the decision-making process as well as the relations between the research establishments and the State. These guidelines have been incorporated in the statutes of several of the establishments.

The 12 establishments cooperate through a coordinating body, the Arbeitsgemeinschaft der Grossforschungseinrichtungen (AGF), whose task is to advise the State through the Federal Ministry for Research and Technology on problems of long-term and future-orientated research planning and on forecasts for research projects. The AGF provides the establishments with a comprehensive information exchange system on scientific, technical, economic and administrative questions. It also coordinates the R & D activities of the 12 establishments.

The Max-Planck-Gesellschaft (MPG) (Max Planck Society)

The MPG is the central organization of 49 non-university institutes which carry out fundamental research in selected fields of the natural sciences and a number of the humanities and social sciences. These institutes devote themselves to new research fields which are not yet ripe for university research or ill-suited to university research because of their extent and structure. Their main fields in research are biochemistry, biology, plasma physics, nuclear physics, space research, astronomy, radioastronomy, solid state

physics, meteorology, futurology. Some of the Max Planck institutes, and their large-scale equipment, are also used by university research workers.

The 49 institutes, research bodies and temporary project teams of the MPG have very different sizes, structures and tasks. The MPG is an autonomous scientific body, and gives the senior scientists of its institutes, research bodies and temporary project teams a great deal of freedom in the selection of research subjects and the practical pursuit of research. Each institute and independent department is managed by a scientific member, though generally only for a limited period at a time. Research workers contribute to the decisions of the institutes through joint discussion of general aims, methods and implementation of research projects. Most institutes have specialist boards, composed of German and foreign scientists, which advise them and evaluate their work vis-à-vis the management of the MPG.

The Senate of the MPG is the central decision-making body. It decides on the foundation, closure and reorientation of institutes, the adoption of new lines of research, the appointment of scientific members, directors and the heads of independent departments. It also decides on the budget and the use of funds. The Senate elects the president and the administrative board, and decides the statutes of the institutes.

The Standing Senate Committee for research policy and planning advises the president and prepares the research-policy decisions of the Senate. This committee evaluates progress and trends in specific research fields, with a view to proposing new research projects and terminating existing research activities.

The scientific board is the central scientific body of the MPG. To it belong all scientific members appointed by the Senate (currently about 200), and an elected research worker per institute. The scientific board is divided into three sections: chemistry-physics-industrial sciences (16 institutes); biology-medicine (23 institutes); and the humanities (11 institutes). The sections discuss the joint affairs of the institutes, and issue recommendations for the scientific-policy decisions of the Senate, such as the establishment and closure of institutes and departments and the appointment of new scientific members.

The administrative board prepares the major decisions of the MPG and lays down the general budget. Legally it also constitutes, with the general secretary, the management.

In order to promote the industrial utilization of its research findings, the MPG set up in 1970 a company, "Garshing Instrumente GmbH" to produce patented equipment. It is advised by a six-man council representing the MPG, the scientific community and industry.

The Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung (FhG) (Fraunhofer Society for the Advancement of Applied Research).

The FhG was founded in 1949 by representatives of industry, the scientific community and the State. Its main function is to carry out applied research on a contract basis, particularly in the natural sciences and engineering. The FhG is designed to provide a qualified, multi-disciplinary contract research capability for both industry and Government, to promote the application of research carried out on its own initiative and to promote scientific and technological innovation in small- and medium-sized industry.

In 1978, the FhG had a staff of 2,200 (of which 700 were scientific staff) and a budget of DM 127 million. About half its revenue is derived from contracts, with the remainder being funded by the Federal Government (90%) and 6 of the Länder (10%). The FhG runs 25 research establishments, of which 6 carry out R & D work related to defence.

The FhG is governed by a general assembly, which elects 9 members representing science, industry and public life to the Senate. The Senate also includes two representatives of the Federal Government, two representatives of the Länder, the members of its (at least) three-man management board and three representatives of the scientific and technical council. The latter is composed of representatives of management plus one elected research worker from each institution.

The Federal Government Research Establishments

There are about 40 Federal Government research establishments (Bundesforschungsanstalten), some of which were founded in the 19th century. The establishments mainly carry out departmental research for their parent ministries. The fields they cover range from agriculture, forestry, nutrition, biology, medicine, physics and technology, to education, international studies, history and archaeology.

These federal establishments have an aggregate staff of over 10,000.

Research Establishments of the Länder

There are over 50 research establishments which come under the aegis of the different Länder. In 1975 they had a total staff of over 5,000 and a total expenditure of DM 290 million. They cover a wide range of fields, including agriculture, geological surveys, economics, town and country planning and medicine.

Some 30 of these establishments carry out work of supraregional significance, which is covered by the "Königstein Agreement" concluded in 1949. In these instances, the work is financed jointly by the Länder, under conditions which are decided annually by the Ministers of Education and Cultural Affairs together with the Ministers of Finance.

Other Research Establishments

There are also a considerable number of smaller independent research establishments carrying out fundamental R & D over a wide range of fields, whose work is considered to be of supraregional significance and of general interest from a science policy viewpoint. These research establishments are included in the so-called "Blue List", which makes possible their joint financing by the Federal Government and the Länder, not necessarily on a 50:50 basis.

11. Research in Industry

Although it falls outside the terms of reference of the present Study, R & D by private industry is worth mentioning because of its scale. With a total expenditure of DM 12,900 million in 1977 and DM 15,100 million in 1978, the private R & D effort is virtually on the same scale as Government-financed research. Of the research funded directly by private industry, 98.4% is carried out by industry, 0.7% by universities and 0.9% by other research institutes. Allowing for the other funds, we have the following breakdown for research carried out in industry (1978):

	DM '000 million	%
Funded by industry	15.1	78.2
Funded by the Federal Government	3.6	18.7
Funded by the Länder	0.1	0.5
Funded from other sources	0.5	2.6

In 1977, 198,000 people were employed on research in industry.

R & D expenditure in industry is heavily concentrated on applied research and industrial development work, with relatively little spending on the fundamental research. Expenditure is also highly concentrated within a few industries, mainly chemicals and petrochemicals, which account for 28% of the total, electrical engineering and precision mechanics, which take a further 29%, and steel construction, mechanical engineering and vehicle manufacturing (about 34%) (percentages for 1977).

A relatively small number of large undertakings account for the bulk of industrial research. About 4% of the total number of undertakings carrying out R & D are responsible for 70% of total R & D expenditure.

Since 1979, the Federal Government has contributed DM 300 million or so to the wage bill for research workers in small and medium-sized businesses. It contributes 40% to the first DM 400,000 of this wage bill, and 25% of sums above DM 400,000. No firm may receive more than DM 400,000 (DM 500,000 in Berlin). Firms are considered to be small or medium-sized if they employ less than 1,000 or had an average annual turnover of less than DM 150 million in the previous three years.

12. International research

International R & D cooperation furthers the aims of the Federal Government's science policy and makes a major contribution to Germany's foreign policy, foreign trade and development aid.

This cooperation has various forms and takes place with various countries:

- Exchange of information and scientific research staff;
- Participation in bilateral and multinational programmes, in particular cooperation on the development of fast breeder reactors (France and Belgium-Netherlands), on thermonuclear fusion (JET) and participation in the European Organization for Nuclear Research (CERN).
- As in the other Member States, German research supplements the Commission's targets and thus makes for a fruitful interplay.
- Cooperation with the countries which export oil and other commodities, in particular through:
 - programmes for mining coal and extracting oil in China;
 - programme for coal liquefaction in Australia.
- Development aid through the construction of laboratories in LDC's. This cooperation is based on an agreement concluded in 1976 between the Federal Ministry for Research and Technology and the Federal Ministry of Economic Affairs.

The bulk of the financial contributions of the Federal Government to international research institutes goes to the European Space Agency (ESA) and to CERN.

In 1977 total appropriations for international organizations amounted to DM 613 million, including about DM 347 million for ESA, DM 143 million for CERN and DM 16 million for EURATOM.

13. Conclusions

The organization of R & D in Germany is strongly influenced both by the federal structure of the country and by the scale of the public R & D effort which, in absolute terms, is the largest of any Member State in the Community. While there are a large number of public and private research bodies, a small number of large research bodies such as the MPG (Max-Planck-Gesellschaft) and the major research establishments, and promotional agencies such as the DFG (Deutsche Forschungsgemeinschaft) play a dominant role.

The funding of Government-sponsored R & D is shared between the Federal Government and the Länder. But as costs have risen and as greater emphasis is laid on applied research, the Federal Government has tended to assume greater responsibility.

A noteworthy feature of research in Germany is the close network of links within the system between the State, the universities, the research institutes and industry.

Increasing importance is attached to research related to major applied research projects and to research carried out in industrial laboratories and research institutes under their responsibility.

The Federal Government provides substantial support for research in the small and medium-sized business sector, more particularly with a view to improving technology in this sector.

As in the other Member States, the two sides of industry are systematically and continually consulted on the establishment of research plans and targets.

The two sides of industry are always represented in consultative bodies, even if procedures for this are not laid down.

BIBLIOGRAPHY

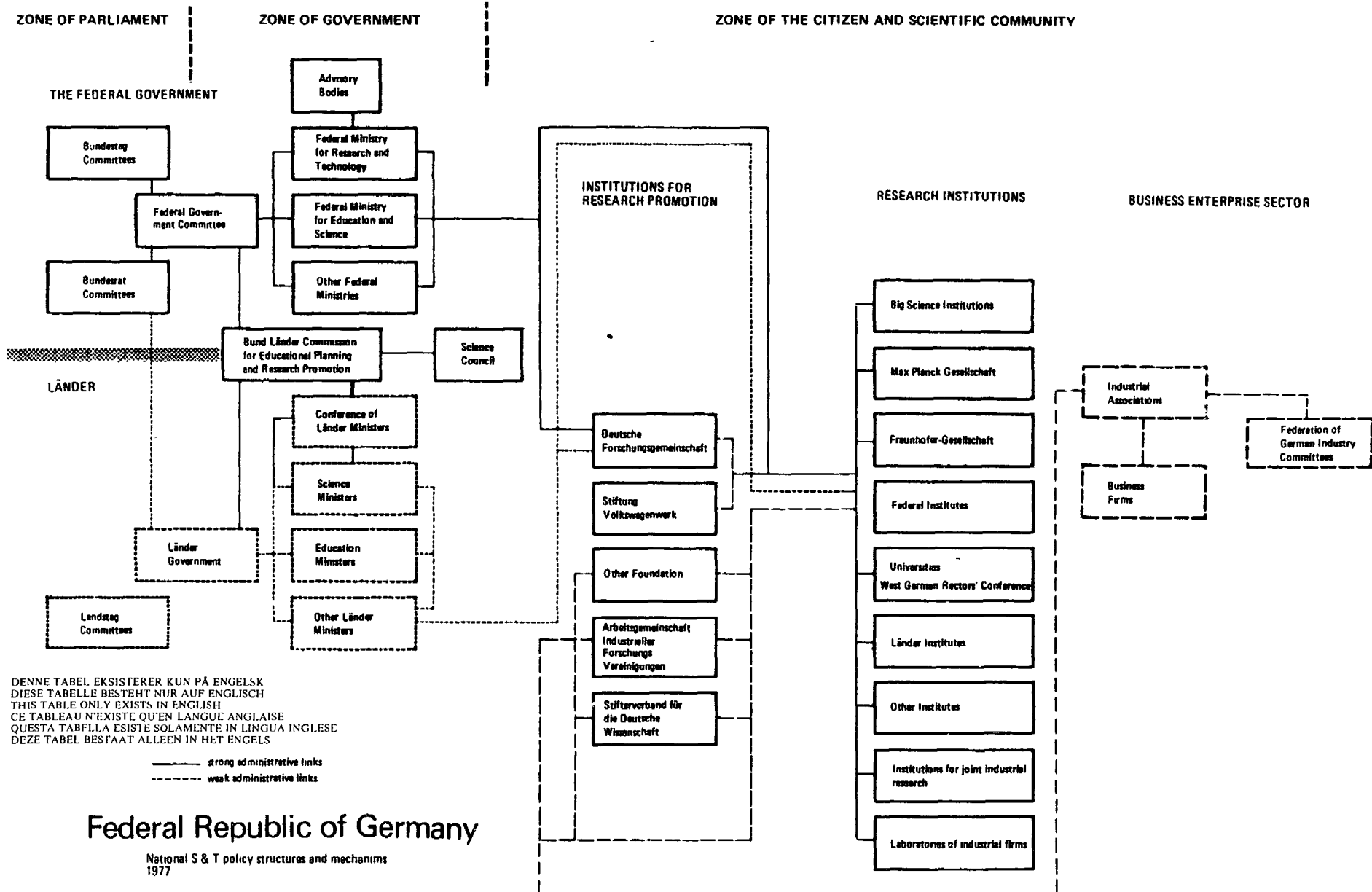
1. *National Science and Technology Policies in Europe and North America 1978 — Present State and Future Outlook*, Doc. UNESCO/MINESPOL II/5 to become No. 43 in series "Science Policy Studies and Documents", UNESCO, Paris, 1979.
 2. *Jahresbericht der Bundesregierung 1977*, Presse- und Informationsamt, Bonn, 1978.
 3. *Faktenbericht 1977 zum Bundesbericht Forschung*, Bundesministerium für Forschung und Technologie, Bonn, 1977.
 4. *Empfehlungen und Stellungnahmen 1977*, Wissenschaftsrat, Bonn, 1978.
 5. *Empfehlungen zu Organisation, Planung und Förderung der Forschung*, Wissenschaftsrat, Bonn, 1975.
 6. *Aufbau und Aufgaben der Deutschen Forschungsgemeinschaft*, DFG, Bonn.
 7. *Deutsche Forschungsgemeinschaft, Jahresbericht 1978, Band I — Tätigkeitsbericht und Band II — Programme und Projekte*.
 8. European Communities, *Government financing of Research and Development — 1970-1978*. Brussels-Luxembourg 1978.
 9. HAUFF, V. and HAUNSCHILD, H.H., ed., *Forschung in der Bundesrepublik Deutschland*, Kohlhammer, Stuttgart, Berlin, Köln, Mainz, 1978.
 10. GEIMER, R. and GEIMER, H., *Science in the Federal Republic of Germany — Organisation and Promotion*, Deutscher Akademischer Austauschdienst, Bonn, 1974.
 11. *Guide to World Science, Volume III.*, Hodgson, Guernsey, 1975.
 12. *Science Research Councils in Europe*. Report of the Conference of West European Science Councils, Stockholm, 1972.
 13. *Science Policy and the Organization of Research in the Federal Republic of Germany*, UNESCO, Paris, 1969.
 14. *Reviews of National Science Policy — United Kingdom, Germany, OECD, Paris, 1967*.
 15. *Gemeinsame Forschung durch Bund und Länder — Die Zusammenarbeit von Bund und Länder bei der Gemeinschaftsaufgabe Forschungsförderung nach Art. 91 b/GG (1979)*, Federal Ministry for Research and Technology, Bonn, 1979.
 16. *Bundesbericht Forschung VI*, "Bericht und Dokumentation" series, Federal Ministry for Research and Technology, Bonn, 1979.
 17. *Beratungsplan 1978*, Federal Ministry for Research and Technology, Bonn, 1978.
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SCHEDULE I

**PUBLIC R & D EXPENDITURE
IN THE FEDERAL REPUBLIC OF GERMANY — 1978**

Mio DM	Heading	Federal Republic of Germany			EFC
		Mio. DM	Mio. ECU	%	%
	1. Exploration and exploitation of the earth and its atmosphere	276.0	108.4	2.0	2.0
	2. Planning of human environment	432.2	169.8	3.1	3.4
	3. Protection and improvement of human health	766.2	301.1	5.5	5.4
	4. Production, distribution and rational use of energy	1 889.7	742.5	13.6	11.6
	5. Agricultural productivity and technology	289.1	113.6	2.1	3.7
	6. Industrial productivity and technology	1 052.5	413.6	7.6	8.2
	7. Social and sociological problems	640.5	251.7	4.6	3.2
	8. Exploration and exploitation of space	581.3	228.4	4.2	4.4
	9. Defence	1 702.1	668.8	12.2	22.3
	10. General promotion of knowledge	6 266.2	2 462.2	45.1	35.5
	Not itemised	-	-	-	0.3
	TOTAL	13,895.8	5,460.1	100.0	100.0

Source: Statistical Office of the European Communities(8)



DENNE TABEL EKSISTERER KUN PÅ ENGLSK
DIESE TABELLE BESTEHT NUR AUF ENGLISCH
THIS TABLE ONLY EXISTS IN ENGLISH
CE TABLEAU N'EXISTE QU'EN LANGUE ANGLAISE
QUESTA TABELLA ESISTE SOLAMENTE IN LINGUA INGLESE
DEZE TABEL BESTAAT ALLEEN IN HET ENGELS

SCHEDULE III

PRINCIPAL PUBLIC RESEARCH BODIES

MAJOR RESEARCH ESTABLISHMENTS

MINISTRY	BODY	Abbreviation	Total Staff (1978)	Budget (1978) D M million	
Federal Government (Ministry for Research and Technology) + Länder	Karlsruhe Nuclear Research Centre	Kernforschungszentrum Karlsruhe GmbH	KFK	3 252	295.3
	Jülich Nuclear Research Centre	Kernforschungsanlage Jülich GmbH	KFA	3 402	313.8
	Marine Nuclear Propulsion Corporation	Gesellschaft für Kernenergieverwertung in Schiffbau und Schifffahrt GmbH. Hamburg	GKSS	583	64.4
	Hahn-Meitner Institute of Nuclear Research	Hahn-Meitner-Institut für Kernforschung mbH. Berlin	HMI	485	62.6
	German Electron Synchrotron Foundation	Stiftung Deutsches Elektronen-Synchrotron. Hamburg	DESY	1 041	138.5
	Max Planck Institute for Plasma Physics	Max-Planck-Institut für Plasmaphysik. Garching	IPP	916	96.0
	Radiation and Environmental Research Corporation	Gesellschaft für Strahlen- und Umweltforschung mbH. Neuherberg	GSF	1 201	99.6
	German Cancer Research Centre	Stiftung Deutsches Krebsforschungszentrum. Heidelberg	DKFZ	683	67.5
	Heavy Ion Research Corporation	Gesellschaft für Schwerionenforschung mbH. Darmstadt	GSI	450	52.1
	German Aerospace Research and Testing Institute	Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V.. Porz	DFVLR	3 155	281.0
	Mathematics and Data Processing Research Corporation	Gesellschaft für Mathematik und Datenverarbeitung mbH. Birlinghoven	GMD	610	55.7
	Biotechnological Research Corporation	Gesellschaft für Biotechnologische Forschung. mbH. Stöckheim	GBF	213	17.4
	TOTAL			15 985	1 543.9

FRANCE

RESEARCH AND DEVELOPMENT — FRANCE

1. Introduction

In 1978, Government spending on research and development in France amounted to some FF 22.4 billion (3.9 billion EUA) (*). This was equivalent to about 5.7% of the total estimated Government budget and just over 1% of GDP. Defence research accounts for a significant proportion of Government R & D expenditure (33% in 1977). This proportion is only exceeded in the United Kingdom where defence takes up 50%. Government expenditure on Industry, Earth and Planning the Human Environment is above the average for the European Community. The shares allocated to Human Health, Agriculture and Space Exploration are close to the Community norm. R & D expenditure on Energy is below average. Another feature is the share of finance devoted to the general promotion of knowledge which, at 24%, is significantly lower than the 50% level which is typical in the three

other large Member States. A breakdown of public R & D expenditure in 1978 by major objective is given in SCHEDULE I.

2. The Institutional Framework

The main bodies involved in drawing up and carrying out R & D in France are shown in SCHEDULE II (situation as of 1 January 1978).

The principal institutional arrangements which relate to science and technology policy were set up by Government Order in 1958, following the adoption of the Constitution of the Fifth Republic. This order was successively amended in 1970⁽¹⁾, 1975⁽²⁾, and 1978⁽³⁾. Responsibility for R & D lies with the different sectoral ministries. But at the same time the system provides for close coordination between them. This is achieved through:

Body	Budgetary Role
The Secretary of State to the Prime Minister (Research)	Coordination
Interministerial Committee for Scientific and Technical Research (CIMRST)	Discussion & Decision
General Delegation for Scientific and Technical Research (DGRST)	Preparation
Advisory Committee for Scientific and Technical Research (CCRST)	Advice

These are briefly described in the following sections.

The coordination procedure which is outlined only applies however to that part of Government R & D expenditure covered by the annual R & D Block Vote (l'Enveloppe recherche). Military R & D, the large civil aeronautics programmes, the National Telecommunications Study Centre as well as some minor expenditure by different Ministries is not covered by the Block Vote. The Block Vote covers approximately 45% of the appropriations earmarked for university research (appropriations drawn from the budget of the research mission of the Ministry for the Universities for work

carried out by the National Centre for Scientific Research, etc.). The remaining 55% (unspecified appropriations in the university budget) are outside the Block Vote. In 1978, the Block Vote accounted for just over half of all Government-funded R & D.

Public-funded R & D is carried out in different ways but the bulk is done by a large number of research agencies under the different Ministries. These are listed in greater detail in SCHEDULE III. Examples are:

Ministry of the Universities	National Centre for Scientific Research (CNRS)
Ministry for Industry	Atomic Energy Commission (CEA)
Ministry of Health	National Institute for Health and Medical Research (INSERM)
Ministry of Agriculture	National Agricultural Research Institute (INRA)

The work of some of the agencies in the main R & D sectors is outlined in sections 9 to 13

(*) Figures from the Statistical Office of the European Communities (8) These figures are slightly lower than national statistics insofar as the latter include French research projects funded by the European Community itself

⁽¹⁾ Government Order No 70-729 of 5 August 1970

⁽²⁾ Government Order No 75-1002 of 29 October 1975

⁽³⁾ Government Order No 78-659 of 23 June 1978

3. Planning and Budget

Government R & D Policy, like all other areas of Government activity, is implemented through two major instruments: the Plan and annual budget. The Plan is a five-year policy blueprint covering all sectors of economic and social activity. It lays down general policy guidelines for all sectors including research. The budget on the other hand fixes actual Government expenditure from year to year. The precise relationship between the Plan and the budget has been the subject of extensive general debate, a debate which is also reflected in the research and the development field. A close link between Plan and budget requires a Plan which contains clearly defined, quantitative forecasts. On the other hand, the different timescales involved almost inevitably call for a difference of approach. A five-year plan which is quantitatively defined cannot make allowance for changes brought about by short-term economic conditions. Such problems tend to be accentuated in periods of economic uncertainty.

To help overcome this problem, the Seventh Plan, described in the next section, while generally set out in broad terms, provides for a hard core of Priority Action Programmes (Programmes d'actions prioritaires) for certain key areas of economic and social development which will be given precedence, no matter what the short-term economic conditions. These priority Action Programmes only account for a relatively small proportion of the total annual Government budget (an estimated 5.6% in 1978).

4. The Seventh Plan

The Seventh Economic and Social Development Plan for the period 1976-1980 was formally adopted in July 1976 ⁽¹⁾. Like its predecessors, it was drawn up under the responsibility of a special Government service, le Commissariat général du Plan, with the close involvement of the Ministry for Economic Affairs and Finance and virtually every other Government ministry. The overall strategy of the Plan is based on 19 sectoral Reports, each of which is drawn up in the course of preparatory discussions involving interested economic and social groups. One of these reports covers research policy (4).

In the area of R & D, the "Délégation générale à la recherche scientifique et technique" (General Delegation for Scientific and Technical Research) prepared medium-term research policy in conjunction with the Commissariat général du Plan. It chairs and services the consultative bodies involved in planning ⁽²⁾.

The Research Report was drawn up by the Research Committee (la Commission de la recherche) made up as follows:

Government Ministries	6
Research Agencies	10
Academics	9
Trade Unions	6
Industry	3
Total	34

The work of the Research Committee was in turn based on 14 sectoral groups, of which some were divided into several groups, covering the whole spectrum of scientific and technical activity. Two "subject groups" (groupes thématiques) examined the problems of scientific cooperation with the developed countries and the Third World respectively. In addition, two "interdisciplinary groups" dealt with problems of interface between several sectors. Each of these groups was made up of a small number of experts and was asked to make an assessment of the current situation in its particular area and to make suggestions for scientific and technical policy guidelines for the Seventh Plan. An interdepartmental study group was also set up to look into the question of redeploying scientific and technical research activities.

The research policy outlined in the Plan is based on two central ideas:

- strengthening of scientific and technical policy, with particular reference to basic research;
- make research contribute more to the achievement of medium- and long-term national objectives.

These objectives were translated into one of the 25 Priority Action Programmes (PAP's) namely "Developing the Country's Scientific Capabilities". The latter action included the following aims:

- a steady annual increase of 3% in the number of workers whose salaries are paid out of the research budget which should be consistent with a 7% average annual rate of mobility among public research workers;
- an average growth rate for basic research no lower than the average growth rate for research activities as a whole;
- improvement of the organization of the use of research facilities.

5. The Secretary of State for Research

Responsibility for coordinating scientific and technical research policy lies with the Prime Minister in the first instance. In April 1977^(*), this task was devolved on a Secretary of State to the Prime Minister, who was made responsible for research. Prior to that date, it had been assigned to the then Minister for Industry and Research. The Secretary of State is responsible for the coordination of expenditure covered by the annual R & D Block Vote outlined above. The General Delegation for Scientific and Technical Research (DGRST) is placed at his disposal in carrying out his functions.

⁽¹⁾ Act No 76-670 of 21 July 1976

⁽²⁾ Government Order No. 78-659 of 23 June 1978

^(*) Government Order No 77-431 of 25 April 1977

6. Interministerial Committee for Scientific and Technical Research (CIMRST)

The Interministerial Committee for Scientific and Technical Research (Le Comité interministériel de la recherche scientifique et technique) (CIMRST) is made up of Ministers and Secretaries of State responsible for R & D problems which are placed on its agenda. In practice, this means nearly every member of the Government. The CIMRST is chaired by the Prime Minister or, by devolution, the Secretary of State for Research.

Ministers sitting on the CIMRST may be assisted by the senior officials who deal with scientific and technical research within their respective Ministries. In the light of the agenda, the Chairman may request any other person to participate in the meeting.

The CIMRST meets at least twice yearly. One of the meetings is devoted to its main task, namely fixing the distribution of Government finance for civilian R & D on the basis of a draft put forward by the DGRST. The CIMRST does not however actually vote on the budget. The ultimate decision lies with the Council of Ministers and the Parliament.

7. General Delegation for Scientific and Technical Research (DGRST)

The General Delegation for Scientific and Technical Research (la Délégation générale à la recherche scientifique et technique) (DGRST) plays a key role in the formulation of research policy. It is an administrative body comprising some 180 officials which draws up, promotes and coordinates national research and development policy and monitors its implementation. Being interdepartmental in character, the DGRST is placed directly under the Secretary of State to the Prime Minister (Research).

The tasks of the DGRST are defined (*) as follows:

- to assemble, in conjunction with the ministries and other bodies concerned, the material needed for the framing of R & D policy (i.e. for the setting of objectives, the adaptation of resources and machinery and for framing the policies to be pursued towards employment and the siting of R & D work.
- to prepare, in conjunction with the Commissariat général du Plan, the R & D policy for the medium term. The DGRST manages and services the consultative bodies which take part in the planning.
- to collect and examine, in conjunction with the Ministry for Economic Affairs and Finance, the proposals made with regard to the monies to be spent in the various ministerial departments' budgets on civilian expenditure for scientific and technical research. The DGRST is consulted about every amendment made in the course of the

budgets' implementation to the level or allocation of the R & D monies which are subject to interministerial discussion.

- to receive the reports compiled by the various ministerial inspectors or auditors on the use made of the budgetary appropriations for R & D work. The DGRST prepares, in conjunction with the Ministry for Economic Affairs and Finance, the annual report on all the R & D programmes which the Government lays before Parliament in pursuance of the Budget Act.
- to take note of all the reforms affecting the organization of research and research establishments' statutes. The Minister responsible for research countersigns the texts adopted in this field.
- to participate, in conjunction with the Delegation for Land Use Planning and Regional Action (DATAR) and the regional authorities concerned, in the definition and implementation of the policy to be pursued towards the siting of R & D work.
- to collect the information required for the finalization of a national policy towards the employment of scientific personnel and to study, in conjunction with the Secretary of State for the Civil Service, the provisions required for the implementation of such a policy.
- the DGRST also takes note of all the reforms affecting the employment statutes for research personnel or having repercussions on the policy towards the employment of scientific staff. The Minister responsible for research countersigns the general texts adopted in this field.
- to lend its assistance to the Ministry for Foreign Affairs in dealing with all the problems posed by international scientific cooperation. It watches over and coordinates research bodies' activities in this area.

The DGRST is run by a Director appointed by the Council of Ministers, assisted by Advisers (of whom there are currently three) appointed by the Secretary of State. The DGRST is centred around a Scientific and Technical Planning Unit composed of Planning officers specially chosen for their expert knowledge of the various sectors picked out for national R & D planning. These planning officers are responsible for the scientific and technical examination and review of the topics dealt with by the DGRST's departments. They arrange for the regular consultation of the scientific and technical bodies whose work they keep a watch on, collect information on the sectors they have in their charge and have the regular task of appraising and assessing the programmes which are being prepared or carried out in their sector. They also organize discussions about the major medium- and long-term policy guidelines for their respective sectors.

On the administrative side, the DGRST is made up of seven divisions:

- the Planning and Studies Division:

(*) Government Order No 75-1002 of 29 October 1975

- the Budgetary Affairs Division;
- the Division for Scientific Personnel and Research Facilities;
- the Division for International Affairs and Co-operation;
- the Financial Aid Division;
- the General Administrative and Accounts Division;
- the Information and External Relations Division.

In addition to its coordinating activities, the DGRST has direct responsibility for two financial aid procedures:

- the Scientific and Technical Research Fund,
- part of Industrial Aid.

The Scientific and Technical Research Fund, for which appropriations totalling 369 million were earmarked in 1979 (i.e. 1.6% of total Government R & D expenditure), is administered by the DGRST principally in three ways:

- *The Concerted Actions* (les actions concertées), not to be confused with the European Community activities of the same name, provide for financial aid to public and private laboratories to encourage basic or applied R & D in certain sectors which are deemed to be in the national interest. They generally involve interdisciplinary cooperation on R & D in areas where existing organizations find it difficult to adequately perform this task. Projects are chosen on the basis of extensive discussions between the three main interested categories; i.e. those requesting the information (Government services), the users of results (Government services, industry,) and the suppliers of R & D (researchers and research bodies). The DGRST is generally advised in the selection of projects by expert committees;
- *Contract Programmes* (les contrats de programmes). This new procedure was set up in 1978. Public or private bodies are given responsibility for administering and implementing certain research programmes after they have been finalized and discussed with the DGRST. In the public sector, it provides for contracts drawn up for project areas which are selected in more or less the same way as the Concerted Actions above. However, unlike the Concerted Actions, a research organization may be entrusted with the management of the project; as regards contract programmes with the private sector these new arrangements make it possible to concentrate the bulk of the resources on one or two undertakings per sector.
- *Specific Actions* (les actions spécifiques) allow for a flexible form of support in particular cases which are not covered by the other activities of the DGRST. They can be used to provide ad hoc solutions to specific problems or to finance feasibility studies prior to embarking on Concerted Actions.

The Industrial Aid scheme accounted in 1979 for estimated expenditure of FF 403.7 million (i.e. 1.7% of Government financed R & D). Under the scheme, the Government finances 50% of the cost of projects designed to demonstrate the industrial viability of new

techniques which are close to practical application (i.e. construction and development phase of industrial prototypes or pilot plant). The grant is repayable in the event of the project being a commercial success. Prospective projects are evaluated in the light of their technical significance, innovation content and inherent risk. They are examined against economic and financial criteria to assess their general impact (i.e. potential market, job creation, etc.). Account is also taken of the situation in the industrial sector concerned, national and international competitiveness, significance for the economy, general interest in supporting the sector, etc. Priority is given to projects which:

- are shown to be in the interest of society as a whole; i.e. improvement of living and working conditions, etc.;
- contribute to increased independence of the country in the supply of energy and raw materials;
- are likely, where successful, to contribute to an increase in exports.

Up to the end of 1978, this aid was directly administered by the DGRST. For the 1979 financial year, FF 358.2 million will be paid out by the Industry Ministry since that part of the aid concerns activities for which this Ministry is responsible. The FF 45.5 million paid out by the DGRST will be devoted to three areas: public works and buildings, agricultural and food industries, transport. From 1980 industrial aid will be replaced by *aid for innovation* administered by ANVAR (see section 10 below).

8. The Advisory Committee for Scientific and Technical Research (CCRST)

The Advisory Committee for Scientific and Technical Research (le Comité consultatif de la recherche scientifique et technique) (CCRST) advises the Government on all general problems related to national science policy. It consists of 16 members who are chosen for their qualifications in scientific and technical research or in economic and social questions. At least a quarter of the members must be researchers elected by the consultative bodies of the research organizations. At least another quarter of the members must come from outside the Paris area. The CCRST is currently made up of four industrialists, five representatives of the research bodies and seven academics. The members are appointed for a two-year term of office, renewable for one further term.

The CCRST is attached to the Secretary of State for Research. It gives its opinion on the overall guidelines of national policy on science and technology as well as the reports which are submitted to it by the Secretary of State for Research, specifically those relating to organization, employment, programmes, and budgets. All matters submitted for study to the CIMRST are referred to the CCRST for its opinion. The CCRST can also offer advice to the CIMRST on its own initiative.

In preparing its opinions, the CCRST often sets up working parties and can call in experts to obtain the necessary background information.

A number of Coordinating Committees also exist in certain sectors, functioning as specialized versions of CCRST for a given research area. They are generally composed of specialists in the field, representatives of Government Ministers and other interested organizations. The main examples are:

- The Consultative Committee for Energy Research and Development;
- the Committee for the Coordination of Technical Research;
- the Committee for the Coordination of Biological and Medical Research;
- the Committee for the Coordination of Research with Developing Countries;
- the Committee for Nuclear and Atomic Physics.

9. The National Centre for Scientific Research (CNRS)

The CNRS was set up in 1939 as an independent public body under the aegis of the Minister for the Universities. It has a staff of 21,600 and its budget for 1979 was FF 3.2 billion. It covers a wide range of disciplines and is by far the largest organization carrying out R&D in France. Besides being the national repository for fundamental R&D, it also functions as a national centre for applied research. In 1979 the CNRS was reorganized(*). It was given the brief of "commissioning or carrying out, guiding, prompting, coordinating, assessing and developing research of relevance to the advancement of science and economic and social progress at national or international level and of promoting the implementation of such research".

The CNRS has the task inter alia of:

- encouraging and facilitating the development of research undertaken in establishments of higher education and public or private research;
- subsidizing, developing or establishing laboratories for basic and applied research;
- seeing to the publication of scientific work;
- allocating subsidies for scientific missions and for periods spent by research workers in laboratories or research centres in France or overseas;
- participating under conditions laid down by Government Order, in public or private bodies for the purpose of developing innovations or processes resulting from research pursued or encouraged by it;
- appointing specialists from various disciplines to research bodies in the light of scientific requirements;
- in general, carrying out any research function assigned to it by the Minister for the Universities.

At organizational level, the CNRS will be administered by:

- a *President*, selected from leading figures in the world of science, and appointed by Government order for three years;

- a *Council*, comprising:
 - the Director of General and Financial Affairs at the Ministry for the Universities;
 - the Director of the General Delegation for Scientific and Technical Research;
 - the Director for the Budget at the Ministry for the Budget, or an alternate designated by Government order;
 - the Head of the Research Mission at the Ministry for the Universities;
 - four leading figures chosen for their qualifications in the field of industrial and applied research.
 - six leading figures chosen for their scientific competence, including one proposed by the Academy of Sciences and one proposed by the "Collège de France".
- the *General Directorate*, which consists of a Director-General, a Secretary-General, scientific directors, scientific advisers and directors of national institutes. There is also:
 - a Steering Committee;
 - a Scientific Committee;
 - a Staff Consultative Committee.

In addition, provision has been made for a *National Committee for Scientific and Technical Research*, which issues opinions on the work of research staff and the quality of research submitted to it for assessment. This Committee will be composed of specialized sections corresponding to the various scientific disciplines.

The "CNRS Group" covers a number of centres, institutes, laboratories and agencies engaged in basic research. The whole organization comes under the Minister for the Universities, from whom it receives a large grant each year. The centrepiece of the group is the CNRS itself — a financially-independent public administrative body with its own legal personality.

Apart from having "forces" of its own, the CNRS maintains links with:

INAG *National Institute for Astronomy and Geophysics* (1967).

Budget separate to that of the CNRS — does not have public establishment status.

Promotes and coordinates research in astronomy and geophysics conducted by French research institutes. However, it does not run any laboratories.

IN2P3 *National Institute for Nuclear Physics and Particle Physics* (1971)

Public establishment — promotes and coordinates research carried out in the nuclear physics and particle physics sectors and manages the resources earmarked for research in these fields.

The various types of research activity within the CNRS are shown in the table on page 93

(*) Government Order No 79-778 of 10 September 1979

10. National Agency for the Utilization of Research Findings (ANVAR)

ANVAR was established in 1968 under the aegis of the CNRS in order to facilitate the utilization of the results obtained by public services and undertakings and in order to maintain links between research and industry.

Following a recent internal reorganization ANVAR will henceforth come under the Industry Ministry. Reorganization touched on three areas:

- expansion of ANVAR's brief to include the allocation and supervision of aid for innovation;
- changes in the structure of the Management Board;
- the establishment of a Steering Committee representing the economic and scientific circles involved.

ANVAR's extended brief will involve:

- contributing to information and promotional campaigns for the purpose of fostering innovation;
- ensuring, under agreements concluded with public services or undertakings, the utilization of inventions stemming from research work carried out in these undertakings or services;
- supplying undertakings with all requisite information on public aid procedures.

From 1980, ANVAR will be responsible for (a) *industrial aid* (which was previously the responsibility of the DGRST and the Industry Ministry), (b) *predevelopment aid* (Ministry for Industry). These two funds will be lumped together under the heading of *aid for innovation*. Aid for innovation will be available for all stages of the innovation procedure (patents, market surveys, development of prototypes, experiments, development of new procedures and products).

Aid, under the form of either a grant or an advance, may not exceed 50% of the total expenditure involved. It will be paid out by aid committees, comprising representatives of the main Government Departments involved and will sit in national or regional groups. This regional dimension is designed to secure smaller businesses easier access to aid.

11. Energy Research

In this sector, France's spending is slightly below the Community average (amounting to 7.9% of its total R&D budget as opposed to 13.6% in the Federal Republic of Germany and 11.6% throughout the Community). However, conservation is the most important of the twenty-five Priority Action programmes (PAP's), to which the French State pays very special attention. In fact there has been a relatively high growth rate in recent years in R&D expenditure on nuclear energy and new forms of energy. In terms of the work done and the budget it has at its disposal (FF 3 billion), the Atomic Energy Commission (CEA) is the main establishment engaged in energy research (with its electronuclear programme occupying a prominent place). Several other establishments, such as the Solar Energy Commission (COMES), the Research Fund

(DGRST) and IN2P3 (CNRS) are also involved in this form of research, which is concentrated on energy production, transport and storage as well as the improvement of socio-economic wellbeing, etc.

12. Industrial Research

R & D work in this sector is largely a matter for industry itself, both private and public enterprises. The effect is heavily concentrated in the hands of a small number of large undertakings. In 1976, some 25% of total R & D spending (public and private) in industry was financed from Government sources. 85% of Government support goes to two sectors: aeronautics (62%) and electronics (23%). It takes the form of financial aid to its own research agencies, grants to specific undertakings such as the National Corporation for the Aerospace Industries (Société nationale des industries aérospatiales — SNIAS) and the various indirect incentive schemes such as the Industrial and Scientific Research Fund and the Industrial Aid Scheme.

Public authority expenditure on industrial R & D fluctuated between 1966 and 1976. Expenditure rose during 1967, 1971 and 1972, but fell in 1968, 1970, 1973, 1975 and 1976. Public expenditure on R & D rose by an annual average of 0.7% during this period, i.e. seven percentage points below the more regular increase of expenditure on R & D by industry itself (15).

13. Agricultural Research

R & D in the agricultural sector is carried out primarily by the National Agricultural Research Institute (INRA), a public body which was set up in 1946. Its work covers a broad area, ranging from agricultural production (reducing imports, increasing exports) to technological improvements in the food processing industry and improvement of the natural environment. Specific work is also carried out by the National Study and Experimental Centre for Agricultural Machinery (CNEEMA) and the Association for the Coordination of Agricultural Technology (ACTA).

14. Health Research

This sector is worth special mention in the European Community context because of the existence of a major public research body, the National Institute for Health and Medical Research (INSERM), which has a staff of over 3,000 and a budget approaching FF 500 million annually. In addition to INSERM, the CNRS and the Pasteur Institutes play a fundamental role in biological and medical research. This is the reason behind the establishment of the Committee for coordinating Biological and Medical Research (see p. 164 and 165) in order to ensure consistency in the development of research in a multipolar system.

15. Comments

While the principal bodies for coordinating R & D have counterparts in other Member States, the actual emphasis on central coordination of R & D in France

MAIN TYPES OF ACTIVITY OF THE CNRS

Own facilities	Own laboratories	These laboratories (of which there were 122 in 1971 and 168 in 1977) are grouped together according to the fields they cover, viz.:
		Mathematics — basic physics 18
		Physical engineering sciences 22
		Chemistry 24
		Earth and space sciences 18
		Life sciences 45
		Human sciences 41
	Research teams	Teams of 5-10 researchers, created more often than not on an ad hoc basis for a specific topic. Duration of research projects 4 years, renewable for 2 years. There were 143 such teams in 1977.
	Research groups	Consisting of several research teams working in the same field. Duration of research projects 4 years, renewable for 4 years. There were 31 of these groups in 1977.
Work contracted out	Associated Laboratories	270 in 1977.
	Associated teams	559 in 1977.
	Coordinated research groups (GRECO)	Set up at the instigation of the CNRS, which brings together teams previously working in different places on related subjects by concentrating their material facilities and aligning their funds.
	Scientific joint ventures (GIS)	Brought together by the CNRS, which provides additional facilities to simplify the coordination of the work.
Programmed actions (study of one subject with several laboratories or teams)	Programmed Inter-Institutional Research Projects (RCP)	These projects, of which there were 264 in 1977, run for a period of between 1 and 3 years, which is renewable.
	Programmed Actions on Specific Topics (ATP)	Vast programme spread over several years and requiring several teams of researchers, each of which assumes responsibility for a specific topic. e.g. <i>PIR-DES = Interdisciplinary Research Programme for the Development of Solar Energy.</i>
CNRS as the partner of international scientific societies	European Science Foundation, etc.	

seems to be particularly strong, with the Interministerial Committee (CIMRST) being able to make changes to the Research budget, and with the Research budget itself being a genuine financial instrument.

Public R & D in France is heavily dominated by Government-sponsored research agencies (SCHEDULE III), a position resulting from the rapid growth in public R & D expenditure (+ 15% per annum) in the period 1958-1968.

Particular attention is given to research in the preparation of the national five-year Plans. There is an extensive system of prior discussions in specialized groups, which include representatives of the social partners. The Seventh Plan Guidelines for research recommend *inter alia* the fixing of specific targets to tackle overall problems in the research system, i.e.:

- growth rate for public expenditure on basic research;
- 3% average annual growth rate in the number of public research staff which must be consistent with a 7% annual rate of public research staff mobility.

In addition at two inner Cabinet meetings in 1975, the Government set the following targets:

- to protect basic research, annual public expenditure on which should at least keep pace with average overall public spending on research;
- to give priority to research with a direct impact on socio-economic activity (increased exports, cuts in energy and commodity imports, improvement of general living conditions).

This twin strategy was confirmed recently in the following terms: "Without sacrificing basic research values, it is henceforth essential that in France the extremely large proportion of public funds devoted to research workers should be more closely geared to our economic development projects, as is the case with our most advanced competitors" (*).

This concern was one of the factors which prompted the 1979 reorganization of the National Council for Scientific Research (CNRS) — the largest research

body in France. Reorganization was however opposed by the trade unions involved who felt that the reforms had been prepared without prior consultation; that they were detrimental to the unity and scientific impartiality of the CNRS and that they jeopardized staff representation on administrative bodies.

In addition to its five-year Plans, the French Government adopted a ten year research programme in September 1979 (16). Such a time-scale was felt necessary "to plan, construct and implement major contemporary research instruments". The ten year programme was designed:

- to extract, from the confrontation between the principal challenges posed by economic and social development and the dynamism of science and technology, a number of mainstream areas conducive to a large-scale mobilization of scientific potential;
- to propose a new research organization designed to foster quality, openness, cooperation and complementarity between public and industrial research.

The strategy outlined in the programme, which designates certain priority areas, is based on three main themes:

- *increase* in the proportion of French GDP allocated to R & D (currently 1.8%), in order, in the medium-term, to put France on a par with comparable industrial nations (Germany, Japan);
- *decompartmentalization*: One general trend emerges from the investigation of the mainstreams of the research policy pursued over the last ten years. The basic sciences are concerning themselves increasingly with the study of complex inter-active systems: the most fruitful research will frequently involve specialists from different fields; similarly economic and social problems stamp their own complexity on the research carried out on them. This in turn precipitates new forms of programmed cooperation.
- *coordination*, made more necessary than ever by the very existence of such horizontal, multidisciplinary research programmes. Since 1958 France has developed coordinating institutions which have become the instruments of research policy.

(*) Prime Minister's speech to the French Lower House on 19 April 1978

BIBLIOGRAPHY

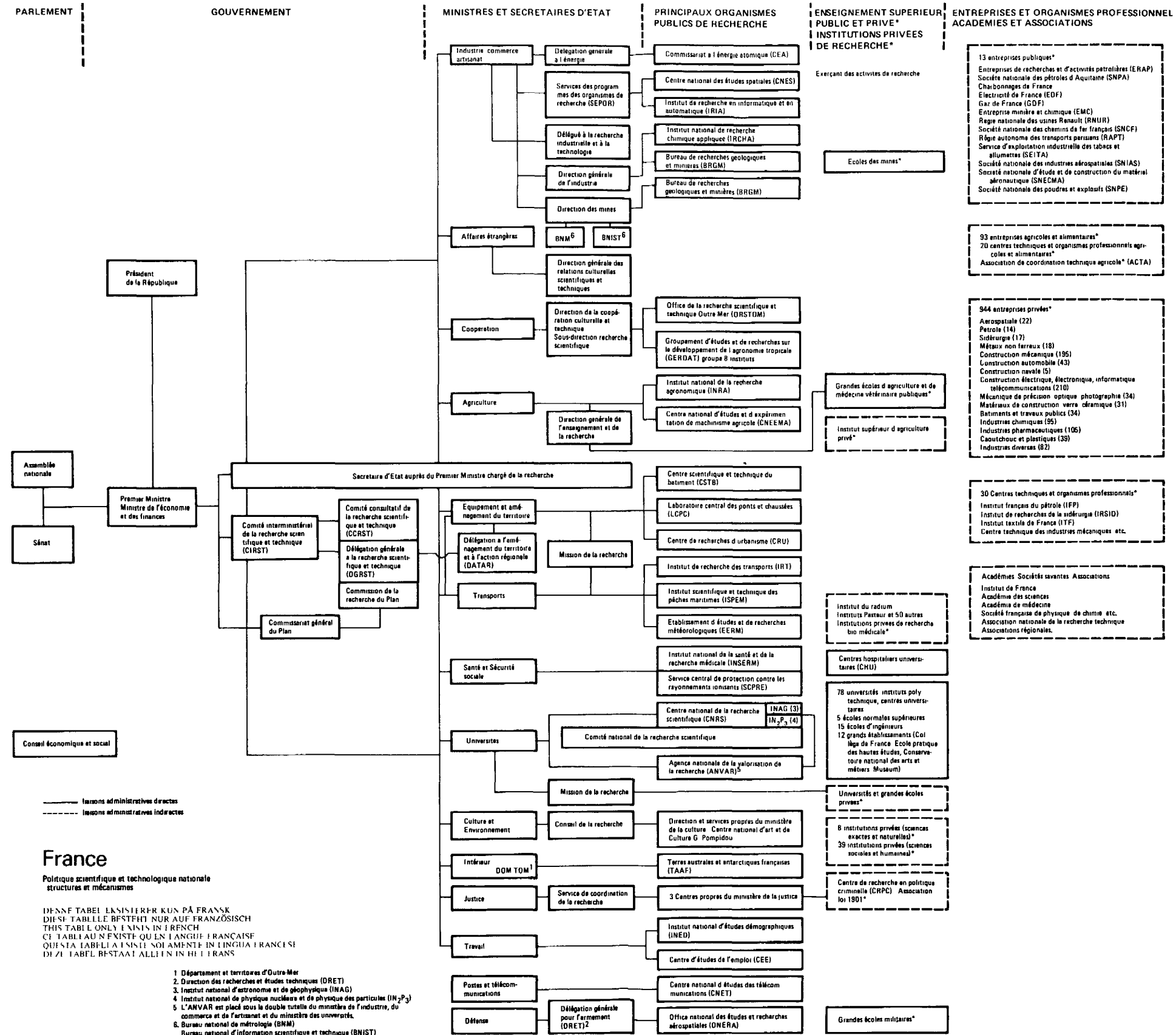
1. *Politiques Scientifiques et Technologiques Nationales en Europe et Amérique du Nord - 1978 - État actuel et Perspectives*, Doc. UNESCO/MINESPOL II/5 to become No. 43 in series "Science Policy Studies and Documents", UNESCO, Paris, 1979.
 2. *La Recherche Scientifique et Technique en France en 1979 - État récapitulatif de l'Effort Financier prévu au titre de la Recherche en 1980*. Annexe au projet de loi de finances pour 1980, Imprimerie nationale, Paris, 1979.
 3. *Schéma Directeur de la Recherche*, Délégation générale à la recherche scientifique et technique, la Documentation française, Paris, 1977.
 4. *Rapport de la Commission Recherche — Préparation du VII^{me} Plan*, Commissariat du Plan, la Documentation Française, Paris, 1976
 5. *VII^{ème} Plan de Développement économique 1976-1980* (Loi No. 76-670 du 21 juillet 1976), la Documentation Française, Paris, 1976.
 6. *Le Progrès scientifique*, périodique, various issues, Délégation générale à la Recherche scientifique et technique, Paris.
 7. *La Politique scientifique et l'Organisation de la Recherche en France*, "Études et documents de politique scientifique" No. 24, UNESCO, Paris, 1971.
 8. European Communities, Government Financing of Research and Development 1970-1978, Statistical Office of the European Communities, Luxembourg, 1978.
 9. *Évolution des Priorités de la Recherche Publique - Étude expérimentale des changements intervenus dans les objectifs des gouvernements dans 12 pays membres de l'OCDE de 1961 à 1972*. OECD, Paris, 1975.
 10. *Guide to World Science - Vol. 2*, Hodgson, Guernsey, 1974
 11. *The Research System - Volume 1, France, Germany, United Kingdom*. OECD, Paris, 1972
 12. *Politiques nationales de la science - France*. OECD, Paris, 1966.
 13. Science Research Councils in Europe. Report of the Conference of West European Science Councils, Stockholm, 1972.
 14. *Les Politiques de Stimulation de l'Innovation Industrielle*, Volume II-I, OECD, Paris, 1978.
 15. *Confrontation des politiques nationales et communautaires de R & D (COPOL 79) - France*. (Doc. CREST/1213/79).
 16. *Le programme décennal de la recherche. une stratégie nouvelle pour la politique scientifique nationale. secrétariat d'État auprès du Premier ministre*, Recherche, Paris, 1979
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SCHEDULE I

PUBLIC R & D EXPENDITURE IN FRANCE — 1978

Heading	France			
	MFF	MEUA	%	FEC %
1. Exploration and exploitation of the earth and its atmosphere	678.5	117.7	3.0	2.0
2. Planning of human environment	1 007.6	174.7	4.5	3.4
3. Protection and improvement of human health	1 229.9	213.3	5.5	5.4
4. Production, distribution and rational use of energy	1 764.9	306.1	7.9	11.6
5. Agricultural productivity and technology	914.0	158.5	4.1	3.7
6. Industrial productivity and technology	2 466.6	427.7	11.0	8.2
7. Social and sociological problems	323.2	56.1	1.4	3.2
8. Exploration and exploitation of space	1 117.7	193.8	5.0	4.4
9. Defence	7 300.0	1 266.0	32.7	22.3
10. General promotion of knowledge	5 457.7	946.6	24.4	35.5
Not itemized	90.7	15.7	0.4	0.3
TOTAL	22 350.8	3 876.2	100.0	100.0

Source: Statistical Office of the European Communities (8).



SCHEDULE III

PRINCIPAL PUBLIC RESEARCH BODIES AND ACTIVITIES

I. "RESEARCH BLOCK VOTE"

MINISTRY	BODY/ACTIVITY	Abbreviation	Total staff 1978 ⁽¹⁾	Budget 1978 ⁽²⁾ (million FF)	
State Secretariat for Research	General Delegation for Scientific and Technical Research	Délégation générale à la recherche scientifique et technique	DGRST	180	769.5
Ministry of Industry	Atomic Energy Commis- sion	Commissariat à l'énergie atomique	CEA	9 749	3 067.3
	National Space Studies Centre	Centre national d'études spatiales	CNES	1 065	1 160.4
	National Centre for the Exploitation of the Oceans	Centre national pour l'ex- ploitation des océans	CNEXO	390	181.5
	Solar Energy Commission	Commissariat à l'énergie solaire	COMES	-	-
	Information and Auto- mation Research Institute	Institut de recherche d'in- formatique et d'automat- isme	IRIA	391	101.5
	Mines Directorate	Direction des mines	-	241	45.8
	Bureau for Geological and Mining Research	Bureau de recherches géo- logiques et minières	BRGM	343	55.6
	National Institute of App- plied Chemical Research	Institut national de re- cherche chimique appli- quée	IRCHA	124	22.2
	Other	Autres	19	68.2	
Ministry of Foreign Affairs	International Cooperation	Coopération internatio- nale	-	-	395.8
Ministry of Cooperation	Office for Overseas Scien- tific and Technical Re- search	Office de la recherche scientifique et technique outre-mer	ORSTOM	1 239	235.6
	Study and Research Group for Tropical Agriculture	Groupement d'études et de recherches pour le dé- veloppement de l'agrono- mie tropicale	GERDAT	913	149.4
Ministry of Agriculture	National Agricultural Re- search Institute	Institut national de la recherche agronomique	INRA	6 873	682.3
	National Study and Ex- perimental Centre for Agricultural Machinery	Centre national d'études et d'expérimentation du machinisme agricole	CNEEMA	152	16.0
	Association for the Coord- ination of Agricultural Technology	Association de coordina- tion technique agricole	ACTA	45	8.3
	Other	Autres	-	-	3.5

Sources: Compiled from (2)

Notes: (1) Research + engineering, technical and administrative staff. Includes non-budgetary staff

(2) Operational expenditure + Programmes (Payment appropriations).

SCHEDULE III

PRINCIPAL PUBLIC RESEARCH BODIES AND ACTIVITIES

I. "RESEARCH BLOCK VOTE"

MINISTRY	BODY/ACTIVITY	Abbreviation	Total staff 1978 ⁽¹⁾	Budget 1978 ⁽²⁾ (million FF)	
Ministry for the Environment and Quality of Life	Scientific and Technical Centre for the Building Industry	Le centre scientifique et technique du bâtiment	CSTB	252	40.6
	Central Bridges and Roads Laboratory	Le laboratoire central des ponts et chaussées	LCPC	343	41.8
	Other	Autres		75	73.7
Ministry of Transport	Transport Research Institute	L'institut de recherche des transports	IRT	194	38.6
	Sea Fishing Scientific and Technical Institute	L'institut scientifique et technique des pêches maritimes	ISTPM	263	33.2
	Meteorological Studies Research Establishment	L'établissement d'études et de recherches météorologiques	EERM	220	-
	Other	Autres	-	2	144.3
Ministry of Health and Family Affairs	National Institute for Health and Medical Research	Institut national de la santé et de la recherche médicale	INSERM	3 346	459.3
	Central Unit for Protection against Ionising Radiation	Service central de protection contre les rayonnements ionisants	SCPRI	127	17.9
	Pasteur Institutes	Les Instituts Pasteur	-	-	52.8
	Curie Institute	Institut Curie	-	-	5.2
Ministry of the Universities	National Centre for Scientific Research	Le centre national de la recherche scientifique	CNRS	21 582	2 755.2
	National Agency for the Advancement of Research	L'agence nationale de la valorisation de la recherche	ANVAR		
	Research Administration	Mission de la recherche	-	515	420.9
Ministry for Culture and Communications			-	202	40.0

Sources: Compiled from (2)

Notes: (1) Research + engineering, technical and administrative staff. Includes non-budgetary staff

(2) Operational expenditure + Programmes (Payment appropriations)

SCHEDULE III

PRINCIPAL PUBLIC RESEARCH BODIES AND ACTIVITIES

I. "RESEARCH BLOCK VOTE"

MINISTRY	BODY/ACTIVITY	Abbreviation	Total staff 1978 ⁽¹⁾	Budget 1978 ⁽²⁾ (million FF)	
Ministry of Labour	National Institute of De- mographic Studies	Institut national d'études démographiques	INED	131	22.2
	Employment Studies Centre	Centre d'études de l'em- ploi	CEE	44	
Ministry for D.O.M.-T.O.M.	French Southern and An- tarctic Territories	Terres australes et an- tarctiques françaises	TAAF	87	28.0
Ministry of Justice	-	-	-	69	9.2
Commissariat général du Plan -National Plan- ning Commis- sion	Centre for the Organi- sation of Applied Eco- nomic and Social Re- search	Comité d'organisation des recherches appliquées sur le développement écono- mique et social	CORDES	7	11.3
Other					589.9
TOTAL I				49 183⁽¹⁾	11.747.0

Sources: Compiled from (2)

Notes: (1) Research + engineering, technical and administrative staff. Includes non-budgetary staff.

(2) Operational expenditure + Programmes (Payment appropriations).

SCHEDULE III

PRINCIPAL PUBLIC RESEARCH BODIES AND ACTIVITIES

II. "RESEARCH OUTSIDE BLOCK VOTE"

MINISTRY	BODY/ACTIVITY	Abbreviation	Total staff 1978 ⁽¹⁾	Budget 1978 ⁽²⁾ (million FF)
Ministry of Defence	Ministerial Delegation for Armaments	Délégation ministérielle pour l'armement	DMA	7 550
	Directorate for Research and Experiment	Direction des recherches et moyens d'essais	DRME	
	National Office for Aero- space Studies	Office national d'études et de recherches aéro- spatiales	ONERA	
Ministry of Posts and Tele- communications	National Telecommuni- cations Study Centre	Centre national d'études de télécommunications	CNET	985
Ministry of Economic Af- fairs and Finance	National Institute of Sta- tistics and Economic Stu- dies	Institut national de la statistique économique et des études économiques	INSEE	
-	University Research	Recherche universitaire		2 083
-	Civil aeronautics pro- grammes	Programmes aéronauti- ques civiles		709
-	Other	Autres		154
TOTAL II				11 481
TOTAL I + II				23 228

Sources: Compiled from (2)

Notes: (1) Research + engineering, technical and administrative staff. Includes non-budgetary staff

(2) Operational expenditure + Programmes (Payment appropriations).

IRELAND

RESEARCH AND DEVELOPMENT — IRELAND

1. Introduction

Government expenditure on research and development in Ireland in 1978 amounted to approximately £IRL 29 million (42 million EUA) (2). In 1976, it accounted for 0.95% of the total Government budget and about 0.5% of GDP. While expenditure per capita on R & D is still among the lowest in the Community, it has had the highest annual growth rate in real terms in the period 1970-1976, despite the adverse effects of the recession. The pattern of expenditure between the different objectives differs markedly from the Community average. Agriculture takes up 41% of the total, although its share has been falling in recent years. Industry, whose share is increasing, comes second with almost 21%. On the other hand, very little is spent on Energy, Space and Defence. The low level of expenditure in these areas, and in public R & D overall, is in part explained by the absence of "big science" programmes. The proportion devoted to the "General Promotion of Knowledge" (which is regarded as expenditure on basic research) is low by Community standards and reflects, partly, the role of research

institutes in overall R & D performance. A breakdown of Government R & D expenditure between the major objectives is given in SCHEDULE I

Another major feature is the rather low investment by private industry in R & D. Only 32% of the total R & D effort (public and private) is funded by the business enterprise sector, compared with 50-75% in most European countries. The Government's role in Irish R & D is therefore predominant, with a small number of semi-autonomous research institutes accounting for the bulk of expenditure.

2. The Institutional Framework

The structure of the research system in Ireland is shown in SCHEDULE II.

Public R & D is organized on a sectoral basis, with each Government Department being responsible for R & D work within its own area. Some Departments carry out R & D intramurally. But in most cases it is performed by semi-autonomous research institutes set up by the different Departments and funded by them. The main examples are:

Department	Research body
Department of Agriculture	The Agricultural Institute (An Foras Taluntais)
Department of Industry Commerce and Energy	The Institute for Industrial Research and Standards
Department of the Environment	The National Institute for Physical Planning (An Foras Forbartha)

In view of their importance, these bodies are described in the text. A detailed list of research agencies under the different Departments is given in SCHEDULE III.

Coordination of Government policy on science and technology is the responsibility of the Minister for Economic Planning and Development and the National Board for Science and Technology which advises him. Both are described in the following sections.

3. The Department of Economic Planning and Development.

In 1977, a new Department of State, i.e. that of Economic Planning and Development was established bringing together a number of planning functions, hitherto the responsibility of other Ministers. The Minister for Economic Planning and Development was, inter alia, made responsible for the coordination of national policy on science and technology and as part of that function the National Board for Science and Technology was placed under his aegis.

The Department is responsible for the National Board for Science and Technology. It also provides the Chairman of an informal Interdepartmental Committee

on Science and Technology in the EEC Context, a body which is composed of senior officials of the different Departments concerned.

In view of the recent creation of both the Department and the National Board for Science and Technology (NBST) which is described in the next section, formal institutional relations are generally still at the formative stage

4. The National Board for Science and Technology (NBST)

The National Board for Science and Technology (NBST) was established by Act of the Oireachtas (Parliament) in 1977 and superseded the National Science Council, a non-statutory body which had operated since 1967.

The NBST was assigned the following general functions:

- to act under the Minister as a body having responsibility for the furtherance of science and technology;
- to advise the Government or the Minister on the Board's initiative or at the request of the Minister on policy for science and technology and related matters;

- to promote the coordination of public investment in science and technology and to prepare proposals for such investments;
- to provide and administer grants and other financial facilities for activities related to science and technology;
- to advise the Minister at his request on any matter related to science or technology;
- to promote appreciation of the value of science and technology.

The Board is composed of a Chairman and a maximum of ten members appointed by the Government, on the recommendation of the Minister for Economic Planning and Development. Members are drawn from the fields of science and industry, and are nominated in a personal capacity. The Board has its own secretariat.

The Board is required to draw up a statement each year, setting out the R & D funding requirements and proposals prepared by each Government Department to which the Board adds its observations and recommendations in the light of national policy for science and technology. This statement is submitted by the Minister for Economic Planning and Development, to the Government. The details of the financial allocations finally approved by the Government, together with the commentary by the NBST, constitute the Science Budget for the year in question and is laid before each House of the Oireachtas (Parliament).

It is intended that the NBST will draw up the Science Budget using as a reference point "a national programme for science and technology" — a blueprint which the NBST will gradually elaborate, and constantly review, in consultation with the relevant institutions.

Although the NBST does not have power to alter financial allocations to the different Government Departments, there has been a noticeable trend in institutional developments to progressively strengthen its coordinating role.

5. The Agricultural Institute — (AFT)

The Agricultural Institute (An Foras Taluntais AFT), the largest research organization in the country, was set up in 1958. Its functions include promoting, coordinating and undertaking agricultural R & D. Although its share of total public R & D expenditure has been falling due to increased efforts in the industrial and other sectors, AFT still accounts for about a quarter of total Government R & D expenditure. It receives about £ 7 million from the Government through the Department of Agriculture (1978). The remainder of its revenue (approx. £2 million) comes from investments, income from agricultural operations, fees for research, contracts and donations. It has a staff of over 1000, in 7 research centres and a further 16 field-stations.

AFT's work covers a broad spectrum of activities. Major programme areas include soils and land use, grassland management, crop production, agricultural

engineering, horticulture, animal production, meat and milk processing, farm buildings, control of pollution and protection of the environment, economics and rural welfare, farm management, marketing and regional development. It disseminates the results of agricultural research particularly to those engaged in agricultural advisory work.

The Institute is governed by a thirteen-member Council whose Chairman is appointed by the President of Ireland. Three members are nominated by the Government, four by the universities and five by the farming and rural organizations. There has, however, been considerable debate over the question of administrative control of the Institute and its relationships to the Department of Agriculture and the farm advisory services run by the local Government authorities. Plans to integrate the Institute with the advisory services by placing them under a National Agricultural Authority were shelved following the change of Government in 1977. The new organizational arrangements which have been proposed are designed to maintain the autonomy of the Institute.

6. The Institute for Industrial Research and Standards (IIRS)

The Institute for Industrial Research and Standards (IIRS) was established in 1946 and reorganized by Act in 1961. It functions as a semi-state body under the aegis of the Minister for Industry, Commerce and Energy who appoints the Board. It is the second largest research establishment in the country with a staff of 600 and an annual grant from the Government of £ 4 million (which represents about 75% of its total revenue).

It carries out a wide programme of R & D, consultancy and advisory work, testing and standards work for all sectors of industry. Its major role to date has been in the provision of technical advice. It has developed a special competence in relation to the service industries (construction, textiles, plastics, minerals and inorganic materials, food processing, printing and packaging).

The IIRS seeks to relate its activity to industrial development by:

- identifying and quantifying valuable investment opportunities through technology;
- identifying appropriate companies;
- providing appropriate assistance packages in conjunction with other state agencies.

The Institute carries out specific research projects on contract for industry and provides technical services at a nominal charge.

7. The National Institute for Physical Planning and Construction Research (AFF)

The National Institute for Physical Planning and Construction Research (An Foras Forbartha — AFF) was established in 1964 with initial assistance from the United Nations. It is responsible to the Minister for the

Environment and functions as a national centre for road research, urban and regional planning, water conservation and planning and nature and conservation.

In 1978 its annual grant was approximately £ IRL 1.3 million. It has a staff of 150.

8. Industrial Research

Traditionally, Irish industry has tended to spend little on R & D but there has been a marked increase in recent years, the total expenditure in the sector in 1975 being £ IRL 9.6 million. The main industrial groups which perform R & D are: food and drink, electrical and electronics, utilities, chemicals and drugs. It is significant that many of the new firms attracted to Ireland in recent years with assistance from the Industrial Development Authority have been in these groups.

The Industrial Development Authority (IDA) provides among other incentives a Research and Development Grant Scheme. The scheme is designed to encourage industrialists to devote more of their resources to development of new or improved products or manufacturing processes, using where possible local resources or raw materials. Grants are provided to cover 50% of capital costs. The grants, which are not repayable, are awarded on the basis of the objective criteria, through a committee representing the major state bodies connected with research and industrial development.

9. Research in the Higher Education Sector

The higher education sector in Ireland accounts for some 25% of Government-financed R & D expenditure. About one third of this total is applied R & D. The main

source of finance is through the Department of Education which makes an annual grant-in-aid to the Higher Education Authority. Of this some 15 — 20% is used for R & D purposes in the universities and other higher education institutions. The Department of Education also provides funds directly for university research grants, fellowships, and special educational projects.

10. Comments

The structure of the research system in Ireland differs significantly from those of other Member States. A large proportion of R & D is Government financed. A small number of semi-autonomous state agencies play a dominant role in carrying out the work. The OECD in 1974 (1) noted that these institutes give the country "a strong basis on which to develop", the only real problem associated with this structure being "a tendency towards excessive compartmentalization".

The National Science Council, its successor — the National Board for Science and Technology, and the Science Budget were all ideas which emanated from OECD studies. New R & D activities have been tailored to fit in with international programmes drawn up in the framework of the EEC, COST, etc. International developments have thus exerted an important and growing influence on the system.

At the same time, the key policy bodies, the Department of Economic Planning and Development and the NBST are of recent creation. The development of the science policy system is therefore still at an early stage and will probably evolve considerably in the coming years.

BIBLIOGRAPHY

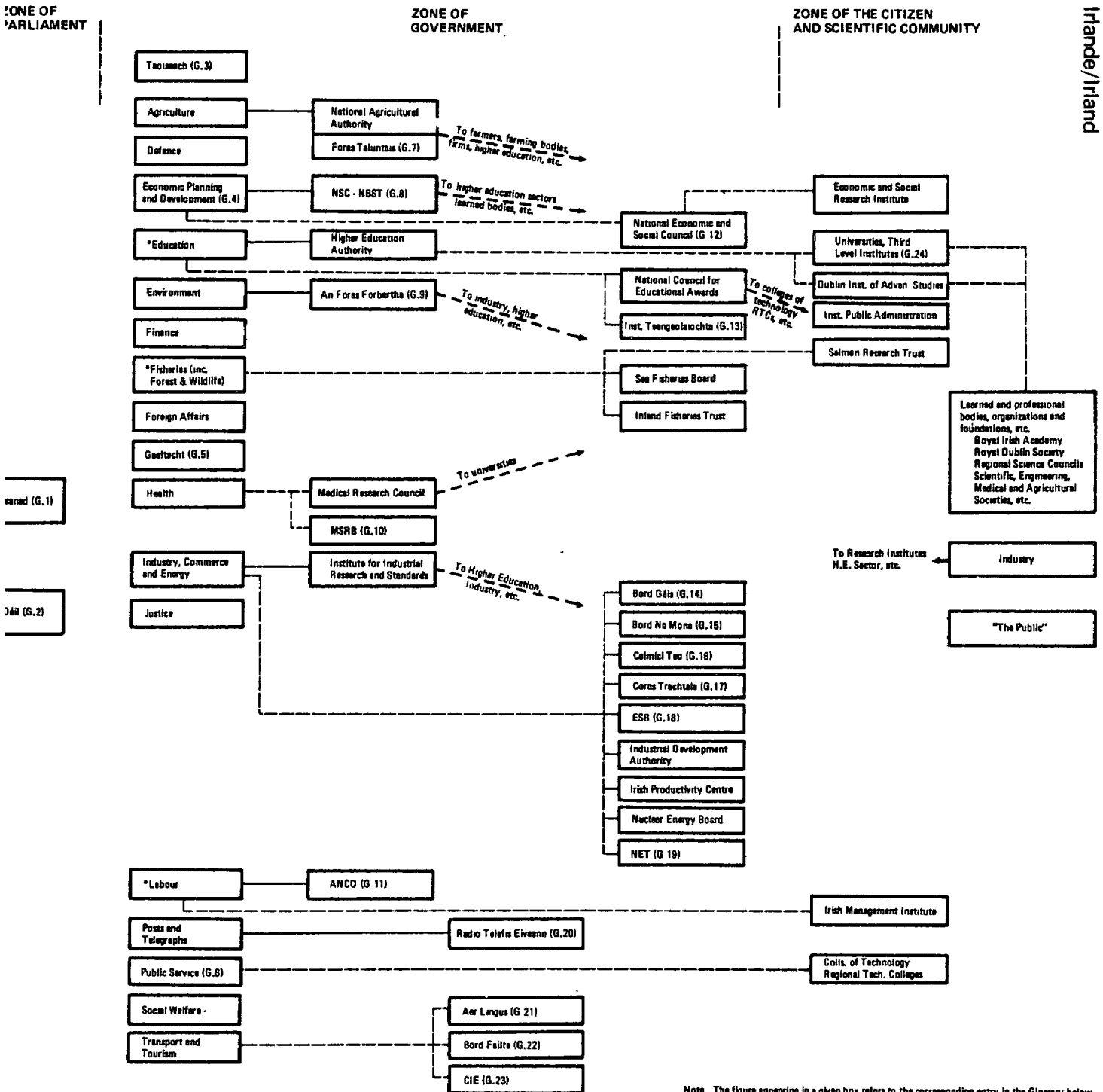
1. *Reviews of National Science Policy - Ireland*, OECD, Paris, 1974.
2. *European Communities, Government Financing of Research and Development 1970-1978*, Statistical Office of the European Communities, Luxembourg, 1978.
3. *Science and Irish Economic Development*, the Stationery Office, Dublin, 1966 (Pr. 8795).
4. *Studies in Irish Science Policy, Report to the National Science Council by the Science Policy Research Centre*, the Stationery Office, Dublin, 1973.
5. *Suggestions on Policies for Science to the National Board for Science and Technology*, the Science Policy Research Centre, U.C.D., Dublin, 1978.
6. HARVEY, A.P. *Ed. Guide to World Science - Volume I*, Hodgson, Guernsey, 1974.
7. HIGGINS, T., *Research Planning and Innovation*, the Stationery Office, Dublin, 1977.
8. MACGUIRE, C., and MURPHY, D., *Research and Development in Ireland, 1975*, the Stationery Office, Dublin, 1977.
9. MURPHY, D. *Scientific Research in Ireland*, National Board for Science and Technology, Dublin, 1978.

SCHEDULE I

PUBLIC R & D EXPENDITURE IN IRELAND — 1978

Heading	M £IRL	Ireland M ECU.	%	EEC %
1. Exploration and exploitation of the earth and its atmosphere	0.7	1.0	2.4	2.0
2. Planning of human environment	1.6	2.4	5.8	3.4
3. Protection and improvement of human health	1.7	2.6	6.1	5.4
4. Production, distribution and rational use of energy	0.4	0.6	1.4	11.6
5. Agricultural productivity and technology	10.4	15.3	36.3	3.7
6. Industrial productivity and technology	5.4	7.9	18.8	8.2
7. Social and sociological problems	2.4	3.5	8.3	3.2
8. Exploration and exploitation of space	0.5	0.7	1.6	4.4
9. Defence	-	-	-	22.3
10. General promotion of knowledge	5.4	8.0	19.0	35.5
Not itemised	0.1	0.2	0.4	0.3
TOTAL	28.6	42.2	100.0	100.0

Source: Statistical Office of the European Communities (2)



GLOSSARY

1. Senate: Senad
 2. Lower Chamber, House of Representatives: Dáil
 3. Prime Minister's Department: Taoiseach
 4. The Minister for Economic Planning and Development is also the Minister with responsibility for science and technology
 5. Department charged with development of Irish speaking areas: Gaeilteacht
 6. Public Service: the Minister for Finance is also the Minister of the Public Service
 7. Fores Talúntais: Agricultural Institute
 8. National Science Council/National Board for Science and Technology
 9. National Institute for Physical Planning and Construction Research: An Foras Forbartha
 10. Medico-Social Research Board
 11. Industrial Training Authority: An Chomhairle Oilúna
 12. National Economic and Social Council
 13. "Language Research Institute": Institiúid Teangeolaíochta
 14. Gas Board: Bord Gáis
 15. Peat Authority: Bord Na Móna
 16. (State) Chemicals Ltd.: Ceimic Teo
 17. Irish Export Board: Coras Trachtais
 18. Electricity Supply Board
 19. (State) Nitrogen Company: Nitrigín Éireann Teo
 20. National Radio and Television Authority: Radio Telefís Eireann
 21. Irish Airlines: Aer Lingus
 22. Tourist Board: Bord Fáilte
 23. National Transport Authority: Coras Iompar Éireann
 24. Includes Universities and Colleges and Designated Institutions of Higher Education
- * Departments performing and/or supporting R&D

Irland

National S & T policy structures and mechanisms 1977

— strong administrative links
- - - weak administrative links

Source UNESCO (1)

DENNE LABEL FKSISIERFR KUN PÅ ENGLISK
DIESE TABELLE BESTEHT NUR AUF ENGLISCH
THIS TABLE ONLY EXISTS IN ENGLISH
CE LABELAUNE NISI QUIN LANGUE ANGLAISE
Questa tabella esiste solo in lingua inglese
DIZI LABEL BISTAVI MULTIN IN TRE LINGUE

SCHEDULE III

PRINCIPAL GOVERNMENT-SUPPORTED RESEARCH BODIES IN IRELAND

Department of Agriculture

- *The Agricultural Institute* (see 5);
- Intramural R & D in veterinary science and cereal breeding and a number of related areas (seed testing, disease eradication).

Department of Economic Planning and Development

- *The National Board for Science and Technology* (see 3);
- Support for *the Economic and Social Research Institute*.

Department of Education

- Intramural R & D;
- Provision of university research grants and fellowships and special education projects;
- *Higher Education Authority* administers Government financial support for the universities and other institutions of higher education, of which an estimated 15 - 20% is used for R & D purposes;
- *Instituid Teangeolaiochta Eireann* (language research institute);
- *Dublin Institute for Advanced Studies*.

Department of the Environment

- *The National Institute for Physical Planning and Construction Research (An Foras Forbartha)* (see 7).

Department for Fisheries

- *Sea Fisheries Board (Bord Iascaigh Mhara)*;
- *Inland Fisheries Trust*;
- Support for *Salmon Research Trust*.

Department of Health

- Support for *Medical Research Council* for R & D in hospitals and universities
- support for *Medico-Social Research Board* which was established to carry out research on problems in the field of social medicine.

Department of Industry, Commerce and Energy

- *The Geological Survey Office* which forms an integral part of the Department;
- *The Institute for Industrial Research and Standards* — IIRS (see 6);
- *The Industrial Development Authority* (see 8);

Department of Labour

- *The Industrial Training Authority (AnCO)*;
- support for the *Irish Management Institute*

Department of the Public Service

- support for the *Institute of Public Administration*.

Department of Tourism and Transport

- the *Meteorological Service*.

ITALY

RESEARCH AND DEVELOPMENT — ITALY

1. Introduction

Government expenditure on research and development in Italy amounted to Lit. 829 thousand million (773 million EUA) in 1978. In 1977 spending on research was equivalent to about 1.3% of the total Government budget or 0.43% of GDP. Italian expenditure on R & D is therefore among the lowest in the European Community. The reasons for this are partly structural, partly economic. A significant proportion of Government finance (about 45%) is devoted to the general promotion of knowledge, indicating an effort to provide strong support for fundamental research work in the universities. The proportion allocated to energy and space research is also well above the average for the Community. High expenditure in these areas (i.e. nuclear energy and space) also provides an indication of the significant proportion of Government R & D finance traditionally taken up by international scientific cooperation. Defence research spending is extremely small. The proportions allocated to the other major headings conform closely to the overall Community pattern.

A breakdown of Government R & D expenditure under the major headings is provided in SCHEDULE I.

2. The Institutional Framework

The main bodies involved in drawing up and carrying out R & D in Italy are shown in SCHEDULE II.

In Italy two bodies are responsible for ensuring that R & D structures are consistent with socio-economic development plans and the National Budget. These bodies are:

- The Inter-Ministerial Committee for Economic Planning — CIPE;
- the Minister for the Coordination of Scientific and Technical Research.

3. The Interministerial Committee for Economic Planning (CIPE)

The CIPE is the central economic planning body. In the field of scientific research, the role of CIPE is to:

- monitor how research and development is being carried out and check requirements in this sector;
- lay down *general guidelines* to relate research to applications conducive to the socio-economic development of the country, while respecting the freedom of research;
- to encourage the establishment of research programmes of national interest;
- to approve all scientific and technical research in Italy;
- to approve the proposals of the Minister for Scientific and Technical Research on applied programmes of the CNR and the industrial research programmes financed by the IMI Research Fund on the basis of annual guidelines

4. The Minister for the Coordination of Scientific and Technical Research

The Minister for Scientific and Technical Research is the basic link between scientific research and economic planning. Political action is pursued at two levels:

- firstly, involvement in the decisions of the CIPE;
- secondly, arising from the tasks and duties vested in him by a number of Acts adopted in recent years, the Minister has specific responsibility for the activity of the CNR, industrial research, the development of the Mezzogiorno, space research and international activity.

In the context of a genuinely investigative policy the Minister carries out rather rigorous checks on the "applied projects" of the CNR. This involves in particular checking the extent to which such projects are consistent with the country's socio-economic objectives.

In the area of industrial research the Minister has the task of ensuring that research proposals submitted by industry are consistent with the scientific policy guidelines laid down by the CIPE. The Minister also submits financing proposals to the CIPE. In addition, Act 675/1977 vests the Minister with responsibility for the coordination of industrial research, restructuring, reconversion and sectoral development. Under this Act, the Research Minister has substantial responsibility for (a) granting aid for the establishment, expansion and restructuring of research centres and laboratories concerned with the development of manufacturing activity and (b) the instrument on *research contracts*.

The Act provides for the implementation of *major programmes* linked to individual areas and coordinated with the programme of other economic sectors: the Research Minister is responsible for ensuring that the applied research of State-sponsored bodies and industry dovetails with and is broadly consistent with the major economic sectoral plans.

This also applies to the policy for developing the Mezzogiorno in which the Research Minister is involved in determining criteria and procedures for financing research centres located in the South.

Reference must also be made to the Research Minister's responsibilities in the *space sector*, both at national and international level, and in general the various tasks assigned to him in the international, and in particular in the *Community sphere*, for coordinating Italian involvement in the numerous research programmes.

As regards the operative structures, scientific research is generally carried out by State-sponsored bodies, universities, undertakings, government departments, regions, local authorities. Routine research is subject only to general coordination apart from areas in which the Research Minister has (a) specific supervisory powers or (b) has representatives on the

Executive or Management Boards (as at the INFN, the CNEN, and at the CNR in the case of applied programmes only (*). It should also be pointed out that the Minister for Research has an important role in submitting to Parliament proposals on the preliminary budget of Semi-State bodies, even though he is not directly responsible for this area.

The Research Minister's opinion is certainly influential in this preparatory stage of the budget. It also has an impact during the CIPE's discussion of the Report on the state of scientific and technical research which is submitted every year by the President of the CNR. In short, the Minister administers the following forms of aid for research:

- a) proposals to public or private bodies to incorporate their projects in a programme which may be of interest to them;
- b) aid to sponsored bodies or to bodies on which there is a representative in the decision-making organ;
- c) aid under specific provisions (IMI Fund, laws for the Mezzogiorno, laws on industrial reconversion, aerospace programme).

5. National Research Council (CNR)

The National Research Council (Consiglio nazionale delle ricerche) (CNR) was set up in 1923. It is distinctive in that it plays a major role both in coordinating national R & D policy and in carrying out research. In 1978 the CNR's Budget was Lit. 250 thousand million (equal to approx. 30% of total public spending on Research and Development). Its establishment was approximately 5,500. The aims of the CNR are to:

- coordinate activities at national level in the various fields of science and its application;
- promote the establishment and development of scientific laboratories and ensure their operation;
- implement and finance research programmes of national interest;
- assist scientific institutions and researchers by means of grants, scholarships and awards;
- compile scientific documentation and publish bibliographical bulletins and scientific periodicals;
- to ensure cooperation with the Ministry of Foreign Affairs, Italian participation in international scientific and technical bodies.

The CNR is headed by a President appointed by the President of the Republic for four years, renewable for one further term. The President is generally an academic of high standing.

Administrative roles are played by its Director-General, the Board of Management and the Board of Auditors.

The scientific and technical activities of CNR are directed by the President's Council, composed of the Chairmen of the National Consultative Committees and a number of senior Government officials.

(*) On 15 September 1979 the Prime Minister enacted a decree giving the Minister for Scientific Research responsibility for the management and supervision of the CNR.

The CNR has 11 National Consultative Committees which play an important role in carrying out its work. These are made up of a total of 140 members nominated for four years, renewable for one further term. 96 of these are academics elected from different institutions, 20 are researchers in non-academic research institutes coming under Government agencies, 12 are nominated by the Prime Minister from experts in industrial and agricultural questions, while the remaining 12 are co-opted by the other members. The National Consultative Committees cover the following areas:

- 1) Mathematics;
- 2) Physics;
- 3) Chemistry;
- 4) Biology and Medicine;
- 5) Geology and Mineralogy;
- 6) Agricultural sciences;
- 7) Engineering and Architecture;
- 8) History, Philosophy and Philology;
- 9) Law and Political Sciences;
- 10) Economics, Sociology and Statistics;
- 11) Technological Research (applied R & D for small- and medium-sized industry).

The tasks of the National Consultative Committees are:

- to prepare draft annual or pluriannual research programmes and to advise on the Annual Report;
- to programme the research promoted by the CNR or by other institutions;
- to promote the setting up, operation, conversion or closing down of CNR institutes, laboratories, research centres and other agencies;
- to consider applications for grants for study, research or scientific missions;
- to consider applications for the assignment of scientific and technical personnel covered by the CNR budget;
- to take decisions relating to the publications of the CNR or those it subsidizes;
- to arrange competitive scholarship examinations;
- to provide technical assistance for research;
- to issue directives for the preparation of technical standards;
- to make proposals for the holding of national and international scientific congresses;
- to ensure relations with international organizations

Direct research is carried out by the CNR through

- the research bodies directly attached to the CNR, which own their own premises and facilities and directly administer their staff,
- the study centres, which may be set up by the CNR at a university or public establishment, or even a private firm or group of firms.

6. The CNR Applied Research Programmes

The CNR is responsible for carrying out "Applied Programmes". These were allocated a total of Lit 100 thousand million in the three years 1976-1977-1978. There are currently twenty-four "Applied Programmes" covering the following areas:

- 1) energy problems;
- 2) air traffic control aids;
- 3) biomedical engineering;
- 4) biology of reproduction;
- 5) preventive medicine;
- 6) viruses;
- 7) expansion of food resources of animal origin;
- 8) research on new sources of proteins;
- 9) protection of the genetic resources of animal population;
- 10) plant protection products and plant growth regulators;
- 11) mechanization of agriculture;
- 12) improvement, by genetic methods, of crops used for food or industrial purposes;
- 13) preservation of crops and their transport by container;
- 14) consolidation, development and conversion of aquaculture;
- 15) geodynamics;
- 16) improvement of the quality of the environment;
- 17) oceanography and sea beds;
- 18) soil conservation;
- 19) power lasers;
- 20) cultural conservation;
- 21) super-conductivity;
- 22) control of Neo-Plastic growth;
- 23) data-processing;
- 24) Fine and Secondary chemistry.

Each of these programmes is monitored by one of the National Consultative Committees listed in section 5. The Minister for Scientific and Technical Research monitors these programmes with the assistance of an ad hoc Interdepartmental Committee.

7. The IMI Research Fund

The applied research fund which is run by the Italian Finance Corporation (Istituto Mobiliare Italiano — IMI) became operational in 1971. It makes funds available in accordance with the national research policy guidelines and the aid criteria established each year by the Minister for Scientific and Technical Research. These credits are provided in various forms:

- participation in the capital of research organizations formed by public corporations, industrial firms or industrial groups; there are five types of aid in this area (about 1.8% of funds);
- credits granted on favourable terms to public corporations, industrial firms or groups of firms, as well as to research organizations (about 70% of funds);
- loans which are repayable where the project is technically successful. In the event of failure, companies have the choice of either (a) repaying the loan and keeping the results, or (b) not repaying but submitting the results. In practice firms have usually opted to keep the results and pay off the loan (about 20% of the total budget);
- in the form of non-refundable loans up to a ceiling of 40% of the projects. Where the projects relate to

the Minister for Industry's sector plans, they are eligible for aids up to 60% (2% of funds are currently assigned in this way but an increase is scheduled).

Before 15 September each year the Minister for Scientific and Technical Research reviews the administration of the Fund for the CIPE and forwards a report to Parliament on this subject

Finally, further extensions were introduced by Act 675 dated 12 August 1977 which refinanced the Fund for Applied Research to the tune of Lit. 200 thousand million and set up a new Fund of Lit. 400 thousand million for grant-in-aid to high-industrial risk projects of particularly technological relevance. This provision widens the scope of aids for research projects into pilot and semi-industrial plants, research projects whose results lead to prototypes and measures designed to channel results to smaller businesses, for which the Fund has earmarked a 20% reserve.

8. Academic Research

The bulk of academic research in Italy is carried out in Science Institutes attached to the universities and university faculties. Government financial support for this work is channelled mainly through the Ministry of Education. However, the CNR also provides a significant proportion of the balance. Work is also carried out in the form of research contracts for other public agencies such as the CNEN, as well as for private industry.

9. Energy Research

The National Committee for Atomic Energy (Comitato nazionale per l'energia nucleare) (CNEN), was set up in 1960 with a budget of Lit. 150 thousand million (equal to 18% of total public spending on R & D), the CNEN is the largest research body in Italy after the CNR. It has an establishment of over 3,000. Its role is:

- to carry out and promote studies and experiments in the nuclear and radioactive material field;
- to exercise supervision over allied activities;
- to promote the training of experts;
- to encourage international cooperation.

While most of the CNEN work is applied research, it also promotes a certain amount of fundamental R & D.

Fundamental R & D is also carried out by a smaller public agency, the National Institute for Nuclear Physics (Istituto nazionale per la fisica nucleare) (INFN), which runs the National Laboratories at Frascati.

The National Electricity Board (Ente nazionale per l'energia elettrica) (ENEL) does significant R & D work, in close liaison with the CNEN and CNR.

10. Industrial Research

Research in the private sector accounts for some 40% of total R & D spending (public and private). Thus it does not significantly alter the position of the overall

Italian R & D effort vis-à-vis that of other countries. Two state-sponsored industrial bodies, the Institute for Industrial Reconstruction (Istituto per la ricostruzione industriale) (IRI) and the National Fuel Board (Ente Nazionale Idrocarburi) (ENI) run their own research centres as do certain large private undertakings. Work can be contracted out to the university institutes, the CNR, or private research firms.

Government support is provided through the IMI Research Fund, described in 7 above.

In addition, the Ministry for Industry and Commerce runs a number of industrial "experimental stations", which have legal personality and enjoy administrative autonomy. Their task is to undertake surveys, studies, research and analyses in areas such as cellulose, paper, textile fibres, oils and fats, leather, canned goods, citrus extracts, glass, fuels and silk. Research is carried out at the request of firms in the sector concerned in the form of independent projects.

The "sectors" in question have a total annual budget of approximately Lit. 5,000 million drawn from various sources:

- a) appropriations allocated by the Government to the local authorities (20% approx.);
- b) levies imposed on all the undertakings in the sector concerned (60%);
- c) payments by firms in exchange for analysis and consultancy services (20%).

In some specific sectors, the "experimental stations" are financed solely by a limited number of undertakings.

The Central Committee for Industrial Experimental Stations coordinates the activities and thus forms a link between the various research facilities in this area.

11. Agricultural Research

There are about twenty-two agricultural experimental stations. These stations have legal personality and enjoy administrative autonomy. They come under and are supervised by the Ministry for Agriculture and Forestry. They share applied agricultural research in areas such as cultivation, animal husbandry, food-processing, etc. and draw up research programmes. The Committee for the Coordination of Agricultural Research works in close contact with these stations.

In addition to these centres, there are twelve university institutes, which take the form of experimental stations for agronomy, agricultural chemistry, animal science, etc. These stations are financed mainly by government subsidy and to a minor extent by contributions from other bodies and the income from their own assets.

12. Health Research

The Ministry of Health carries out R & D on its own account "intra muros". However, over two-thirds of its annual research budget goes to the Higher Institute for Health (Istituto Superiore di Sanità) (ISS).

The ISS has a staff of over 1,000 and runs some 12 laboratories. It is responsible, inter alia, for the control of medical products, food supplies, air and water pollution and radioactivity. It produces sera, vaccines and antibiotics and acts as scientific and technical information centre in the field of health and sanitation. It participates in international research work of the WHO and FAO.

13. Comments

In Italy public expenditure on R & D is below the Community average. The reasons are partly structural, partly economic. Moreover, in the public sector, expenditure on basic research is largely confined to the universities and to the State bodies such as the CNR, which carries out a number of basic and applied R & D activities, and the CNEN (for nuclear research). In addition, public bodies like the IRI, the ENI and the ENEL devote significant support to R & D. These are however classified as being in private sector (cf. SCHEDULE III).

Despite the existence of the Interministerial Committee for Economic Programming (CIPE) and the Ministry for Scientific Research bodies, the degree of central coordination of Government R & D activities has traditionally been low. Responsibility for R & D expenditure lies essentially with the individual sectoral Ministries. An inventory of actual and forecast expenditure is drawn up in the form of an Annual Report (Relazione generale sullo stato della ricerca scientifica e tecnologica in Italia). It is prepared by the President of the CNR, approved by the CIPE and submitted by the Minister to Parliament. Nevertheless, the Annual Report simply provides general guidelines. It is not a budget in the formal sense, and is not legally binding.

In recent years, however, as a result of various measures, science and technology have been given a much more important role within overall State policy. The measures in question include the applied programmes of the CNR, the IMI Research Fund, aids for the development of research centres under the special aid programme for the Mezzogiorno and low interest loans for investments in the research centres in question.

Parliament is currently examining a Bill for the reform of research in Italy. If approved, the Bill would give the Minister for Scientific Research greater powers to adopt and coordinate R & D activity.

BIBLIOGRAPHY

1. Consiglio nazionale delle ricerche, *Relazione del Presidente del CNR sullo stato della ricerca scientifica e tecnologica in Italia per il 1978*, Roma, 1978.
 2. *Relazione generale sullo stato della ricerca scientifica e tecnologica in Italia per l'anno 1977* Senato della Repubblica, VII Legislatura, Roma, 1977.
 3. *National Science and Technology policies in Europe and North America 1978 — Present Situation and Future Prospects, Doc. UNESCO/MINESPOL II/5, to become No. 43 in the series "Science Policy Studies and Documents"*, UNESCO, Paris, 1979.
 4. *Comparison of National and Community R & D Policies (COPOL) 79 - Italy (CREST/1214/79)*.
 5. Consiglio nazionale delle ricerche, Istituto di studio ricerca e documentazione scientifica — *Quaderni* (Various numbers).
 6. *Reviews of National Science Policies — Italy*, OECD, Paris, 1969.
 7. European Communities — *Government Financing of Research and Development — 1970-1978*. — Statistical Office of the European Communities, Brussels, 1979.
 8. Consiglio nazionale delle ricerche, *I progetti finalizzati*, Roma, 1978.
 9. *Changing Priorities for Government R & D (study of the changes in the objectives of the governments of 12 OECD countries over the period 1961-1972)*. OECD, Paris 1975.
 10. *Guide to World Science — Vol. 4*, Hodgson, Guernsey, 1974.
 11. *Science Research Councils in Europe*, Report of the Conference of West European Science Councils. Stockholm, 1972.
 12. *Policies for the Stimulation of Industrial Innovation — Vol. II-1*, Paris, 1978.
 13. Comitato nazionale energia nucleare, *Il terzo piano quinquennale del CNEN (1974-1978)*, Roma, 1974.
 14. BISOGNO Paolo, *Introduzione alla politica della scienza*, Franco Angeli Editore, Milano, 1977.
 15. IPPOLITO Felice, *Intervista sulla ricerca scientifica*, Laterza, Roma - Bari, 1977.
 16. *Il ricercatore oggi in Italia* a cura di Paolo BISOGNO, Franco Angeli, Editore, Milano, 1979.
 17. ISTAT, *Supplemento al bollettino mensile di Statistica, Anno 1978, No. 1 — Indagine Statistica sulla Ricerca Scientifica*.
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SCHEDULE I

PUBLIC R & D EXPENDITURE IN ITALY — 1978

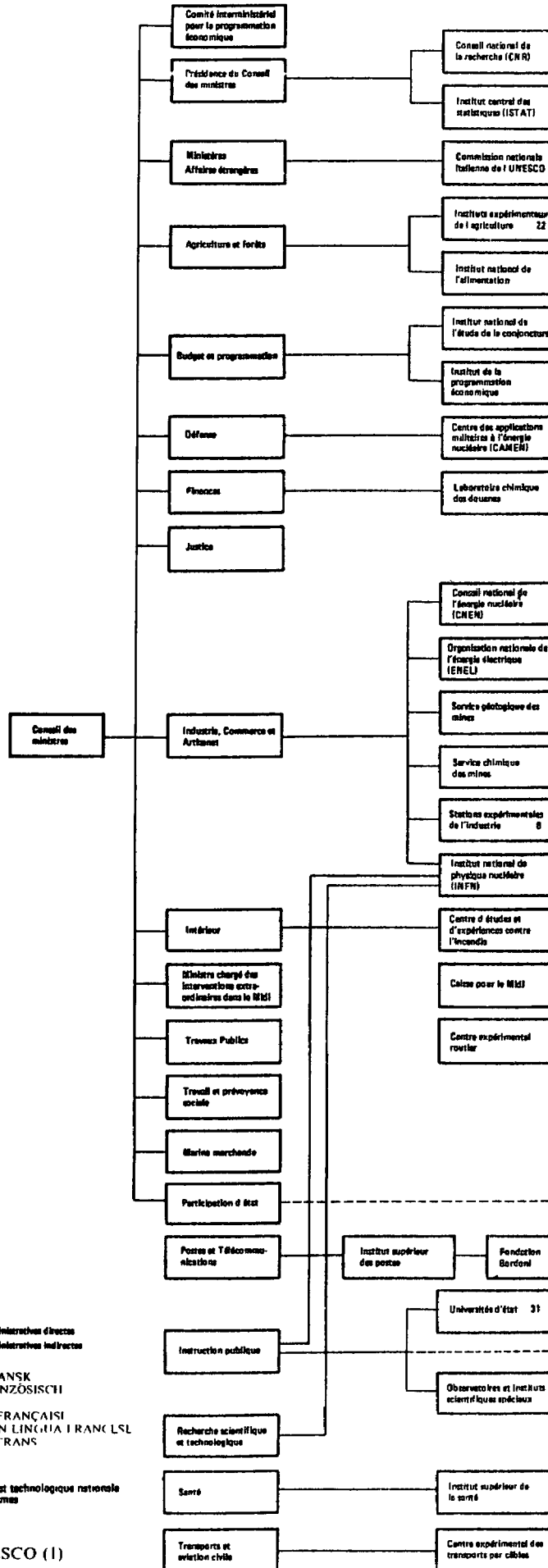
Heading	1 000 M Lit.	Italy MEUA	%	EEC %
1. Exploration and exploitation of the earth and its atmosphere	17.8	16.6	2.2	2.0
2. Planning of human environment	15.2	14.2	1.8	3.4
3. Protection and improvement of human health	44.4	41.4	5.4	5.4
4. Production, distribution and rational use of energy	148.2	138.1	17.9	11.6
5. Agricultural productivity and technology	31.6	29.4	3.8	3.7
6. Industrial productivity and technology	78.7	73.4	9.5	8.2
7. Social and sociological problems	16.7	15.6	2.0	3.2
8. Exploration and exploitation of space	90.5	84.4	10.9	4.4
9. Defence	11.8	11.0	1.4	22.3
10. General promotion of knowledge	374.2	348.7	45.1	35.5
Not itemized	-	-	-	0.3
TOTAL	829.2	772.8	100.0	100.0

Source: Statistical Office of the European Communities (7)

ZONE DU PARLEMENT



ZONE DU GOUVERNEMENT



ZONE DU CITOYEN ET DE LA COMMUNAUTÉ SCIENTIFIQUE



— Liaisons administratives directes
- - - - - Liaisons administratives indirectes

DENNE TABEL FKSISTERER KUN PÅ FRANSK
DIESE TABELLE BESTEHT NUR AUF FRANZÖSISCH
THIS TABLE ONLY EXISTS IN FRENCH
CE TABLEAU N'EXISTE QU'EN LANGUE FRANÇAISE
QUESTA TABELLA ESISTE SOLO AMMENTE IN LINGUA FRANCOSE
DIESE TABELL BESTAAT ALLEEN IN HET FRANS

Italie

Politique scientifique et technologique nationale
structurelle et mécanisme
1977

Source: UNESCO (1)

**BREAKDOWN BY OBJECTIVES OF THE APPROPRIATIONS OF THE PUBLIC SECTOR.
THE ENEL. AND SEMI-STATE BODIES IN 1979**

Lit 000.000

OBJECTIVES	Ministry of Education	Ministry of Defence	Ministry of Agriculture	Ministry of Health	Higher Health Institute	Other Ministries and State Bodies	CNR	CNEN	INFN	Other Research Bodies	Inter- national Contri- butions	Total Public Sector	ENEL	Semi- State Bodies	Grand Total	%
Exploration and exploitation of the earth and its atmosphere	-	-	-	-	-	2 589	25 696	-	-	3 210	82	31 577	-	6 846	38 423	2.5
Planning of human environments	-	-	-	-	-	2 762	10 241	-	-	345	-	13 348	-	87 874	101 222	6.5
Protection and improvement of human health	-	-	-	5 518	16 420	339	42 590	9 543	-	1 817	956	77 183	6 500	1 127	84 810	5.4
Protection, distribution and rational use of energy	-	-	-	-	-	350	16 632	194 388	-	-	20 900	232 270	51 500	47 731	331 501	21.2
Agricultural productivity and technology	-	-	15 004	-	-	3 820	24 916	4 127	-	1 670	2 294	51 831	-	1 160	52 991	3.4
Industrial productivity and technology	-	-	-	-	-	12 805	58 670	-	-	2 121	83	73 679	-	212 512	286 191	18.3
Social and sociological problems	-	-	-	-	-	892	13 443	-	-	4 558	1 089	19 982	-	3 808	23 790	1.5
Exploration and exploitation of space	-	-	-	-	-	-	46 340	-	-	-	55 000	101 340	-	11 779	113 119	7.3
Defence	-	32 751	-	-	-	-	-	-	-	-	-	32 751	-	87 046	119 797	7.7
General promotion of knowledge	246 191	-	-	-	-	206	96 793	-	25 000	618	39 472	408 280	-	337	408 617	26.2
TOTAL	246 191	32 751	15 004	5 518	16 420	23 763	335 321	208 058	25 000	14 339	119 876	1 042 241	58 000	460 220	1 560 461	100.0

Source - Institute for Studies on Scientific Research and Documentation of the CNR

Note - In breaking down the above appropriations, the figures supplied by the bodies concerned were used as far as possible

NETHERLANDS

RESEARCH AND DEVELOPMENT — NETHERLANDS

1. Introduction

Government expenditure on research and development in the Netherlands in 1978 was approximately Fl. 2790 million (1025 million EUA)(*). It accounted in 1977 for some 3% of the total Government budget or approximately 1% of GDP. This overall rate of expenditure is close to the Community average. But there are significant divergencies in the individual objectives to which it is assigned. The shares granted for research on health, environment, social problems and the general promotion of knowledge are higher than for the Community as a whole. The percentage for defence, earth and space exploration and nuclear energy are, on the other hand, relatively low. A breakdown under the major objectives is given in SCHEDULE I.

In addition to Government expenditure, there is a substantial R & D effort funded by private industry. Indeed private R & D accounts for 60% of total R & D expenditure (public and private) in the Netherlands. A large proportion of industrial R & D is carried out by five large firms alone — Shell, Unilever, Philips, AKZO and the Dutch State Mines. R & D in the private sector falls outside the scope of the present study. But its size in the Netherlands must be mentioned. It has an important bearing on Government funding and policy on industrial R & D.

2. The Institutional Framework

The main bodies involved in the drawing up and carrying out of Government science policy in the Netherlands are shown in SCHEDULE II.

As in most of the other Member States, prime financial responsibility for Government R & D lies with individual Government Ministries. Almost all have R & D activities. But three Ministries account for 83% of total public R & D expenditure (i.e. Education and Science 62%, Economic Affairs 11%, Agriculture and Fisheries 10%).

Since 1972 the Canadian "concerted-action" model has been followed. Under this system, each Minister remains responsible for research which relates to his own area, but in agreement with the Minister of Science Policy, makes that research form part of a coordinated overall policy, over which the Council of Ministers has the ultimate decision-making power.

The following bodies conform to this model:

- Science Policy Committee (RAWB);
- The Interdepartmental Committee for Scientific Policy (IOW);
- Minister for Science Policy;
- Council of Ministers Sub-Committee for Science Policy (RWB);
- Parliamentary Sub-Committees for Science Policy.

A number of other specialized policy advisory bodies have been set up. These are also mentioned in the following sections.

- In the policy execution area, the main agencies are:
- the Organization for Applied Scientific Research (TNO) (applied R & D);
 - the Organization for the Advancement of Pure Research (ZWO) (fundamental R & D);
 - the Royal Netherlands Academy of Sciences (KNAW) (fundamental R & D)

These and their principal sub-bodies are also described in turn.

3. The Minister of Science Policy.

The post was created in the Cabinet in 1971. When the new Cabinet was installed in 1973, the Minister was given responsibility for science policy only. The Minister's prime responsibility is the establishment of a coordinated policy in the field of science. In 1973 the Minister was given responsibility for two areas:

- 1) the framing of a coordinated science policy, with the emphasis on ensuring that research programmes interlock with each other and are consistent with the priorities of overall government policy;
- 2) the effective implementation of State-financed research, particularly as regards the link between activities in the various areas and points of common interest.

The Directorate-General for Scientific policy, an administrative unit under the Ministry for Education and Science, assists the Minister for Science Policy in carrying out his duties.

The Minister's specific functions include:

- compilation of an annual "Science Budget" in collaboration with the competent Ministers;
- preparation of meetings of the Council of Ministers' Sub-Committee for Science Policy (RWB) (See 4 below);
- coordination and implementation of RWB decisions;
- the provision of the Chairman and Secretary of the Interdepartmental Committee for Science Policy (IOW) (See 5 below).

The "Science Budget" was introduced in 1967 and has been developed progressively since. It is an inventory of research in the various sectors. It sets out the research chapters, describes the available resources and investigates the various sectors. From the financial angle, it is not a "budget" in the strict sense of the term, but rather a compilation of the data supplied by the different Ministers. Neither the Ministry nor the Cabinet Sub-Committee for Science Policy (RWB) has the power to reallocate funds between headings. In effect, this means that the "Science Budget" has not brought a shift in financial control which still rests with the various ministries. Although it is not a science

(*) Statistical Office of the European Communities. The data differs slightly from national figures as a result of different methods

budget as such, it has proved useful as a conceptual and explanatory tool. It is intended to gradually build up the science budget into a blueprint for science policy implementation. In 1975 it was decided to insert a pluri-annual estimate for R & D research over a five-year period. It is also intended to turn the science budget into a policy instrument on the basis of tasks and responsibilities specified by the Minister for Science Policy in 1978:

On 5 September 1978, the Government (10) defined the functions of the Minister of Science Policy, strengthening his role in a number of areas.

It has also been decided to involve the Minister for Science Policy in university research, the work of bodies such as the ZWO and KNAW (see below) and the leading technical centres. It has also been agreed that the Minister will liaise between the departments in the field of oceanography, space research and technology, and that he will have prime responsibility for supplying information on science and technology.

The Minister is also responsible for the modestly-endowed "Stimulation Fund" which has been allocated Fl. 5 million for 1979, rising to Fl. 13 million in 1981. The Fund is designed to finance small-scale projects which are necessary from the science policy aspect, but are of importance for more than one ministry, and which are principally long-term or fall outside the financial resources of the ministries.

At Cabinet level it was also agreed that the Science Budget should be made a more effective financial instrument for the purpose of involving the Minister for Science Policy more closely in drawing up the departmental estimates on scientific research. This entails:

- a) An agreement in principle that the Minister for Science Policy is involved at an early stage in the preparatory departmental level work on the budgetary appropriations falling under the general heading of scientific activities. There is to be interdepartmental consultation on the appropriate procedures;
- b) Agreement with the Minister for Science Policy's proposal to draw up an investment plan embracing all proposed investments in scientific activity which entail longer-term research and involve substantial State (part) financing.

4. The Council of Ministers Sub-Committee for Science Policy (RWB)

The Council of Ministers Sub-Committee for Science Policy (Raad voor Wetenschapsbeleid — RWB) is composed of all Ministers concerned with science policy. It was set up on an informal basis in 1969 and replaced by a standing committee in 1971. It deals with decisions which do not require the attention of the full Council of Ministers. However to safeguard the principle of "collective responsibility" in Government, the RWB is chaired by the Prime Minister and all of its decisions have to be ratified by the Council of Ministers.

Secretarial services are provided by the Prime Minister's Department and the Directorate-General for Science. The Chairmen of the Interdepartmental Committee for Science Policy (IOW) and the Science Policy Council (RAWB) attend meetings of the RWB.

5. The Interdepartmental Committee for Science Policy (IOW)

The Interdepartmental Committee for Science Policy (het Interdepartementaal Overleg voor het Wetenschapsbeleid — IOW) was set up in 1966. It is composed of senior officials (research coordinators) from the respective ministries under the chairmanship of the Director-General for Science.

The IOW prepares Cabinet decisions and coordinates their implementation. It works closely with the Science Policy Council (RAWB), examining its reports and discussing draft Government communications to it. The IOW is also the forum in which the annual "Science Budget" is drawn up and discussed.

The IOW meets once a month. Secretarial services are provided by the Directorate-General for Science

Other interdepartmental committees have been set up, under the chairmanship of the Director-General for Science, to deal with specific areas requiring specialized attention. These are the:

- Interdepartmental Committee for Space Research and Technology (ICR) (1966);
- Interdepartmental Committee for Oceanography (ICVO) (1973);
- Interdepartmental Committee for Maritime Research (ICOMAR).

6. Parliamentary Sub-Committees for Science Policy and University Education

Both houses of Parliament (States-General) have Standing Committees for Science Policy.

The Second Chamber holds a debate each year on the "Science Budget" and the opinion which the Science Policy Committee (RAWB) has issued on the previous budget.

7. The Science Policy Council (RAWB)

The Advisory Council for Science Policy (RAWB) was established in 1966. The Act establishing the Council defines its advisory role as follows:

- 1) It is the responsibility of the Council to advise Ministers, either at their request or on its own initiative, on matters concerning national or international science policy;
- 2) While preparing Opinions, the Council considers science as a whole and aims at a balanced development of it, bearing in mind the public interest;
- 3) Science in this context covers both pure and applied research in all areas of the arts and sciences and development based on such research;

- 4) Before delivering its Opinions, the Council has to take into consideration the views of other bodies which have been granted advisory authority in the field of science by act of law or Royal decree.

The Explanatory Memorandum which, in 1965, accompanied the Bill for the Council's establishment, states the following about the position of the RAWB:

"The Advisory Council for Science Policy shall be a high level advisory board, independent of scientific circles and government but performing its duties with regard to the public interest and the instruments the government has at its disposal to stimulate this. The consultative function is central to its brief. It views the subjects to be studied against the background of scientific activity as a whole, while bearing in mind relevant aspects of a non-scientific nature. Such aspects include: economic interests, financial consequences, social implications and political aspects. Account must also be taken of the scope for applying the results of such scientific research and the consequences on society. In this way, the Council's Opinion is given an extra dimension from the public interest angle."

The Council sends its Opinion to all Ministers and Secretaries of State. As a rule, a request for an Opinion will come from only one or a number of Ministers; however, the Act establishing the Council requires it to send its reports to all members of the Cabinet.

The RAWB has five to nine members — there are currently nine — appointed by the Crown for a five year period. The members, who are appointed in a personal capacity have widely varying scientific and technical backgrounds. They hold positions within the universities, State Research Institutes and industrial undertakings. They are eligible for reappointment for one term only and their total term of office can not, therefore, exceed ten years. The Council Chairman's main duties consist of chairing meetings. The Vice-Chairman devotes a considerable time to Council work. The remaining members are expected to be available for Council work on two days a month. The RAWB has a small Secretariat comprising seven graduates plus back-up staff.

Each year, the RAWB submits a detailed Opinion on science policy resulting inter alia from the Science Budget. As well as providing a detailed review of the individual subjects for which the State is responsible, these Opinions also comment on the major current topics in the field of science policy. The Council in addition issues Opinions from time to time on specific questions. It has issued Opinions on issues such as the relationship between public authorities and industrial R & D, physical planning policy, the environmental R & D programme and the energy research programme.

The Government is keenly interested in the comments of the RAWB and has taken several important initiatives on its advice. These have included shifts in the priority given to R & D in different fields, changes in the way in which the Science Budget is prepared, and the provision of a small allocation on the Minister of Science's Budget for the purpose of stimulating R & D.

8. The Organization for Applied Scientific Research (TNO)

Among the bodies which carry out R & D in the Netherlands, the Central Organization for Applied Scientific Research (Centrale Organisatie voor Toegepast Wetenschappelijk Onderzoek — TNO) is by far the largest. It was established by Act of Parliament in 1932 to ensure that applied scientific research was put at the service of the community in the most efficient manner possible.

TNO has a staff of some 5,000 of whom over 30% are qualified scientists and engineers. It is largely financed by Government subsidy. The basic grant is established by the Minister for Science Policy, accounting for about 9.5% of total Government expenditure on R & D. The remainder of TNO's revenue, about 30% of its total budget, comes from contract research and sponsorship from industry, international organizations and Government institutions. In 1978 TNO had an operational budget of approximately Fl. 460 million Government subsidies totalled some Fl. 260 million. Approximately Fl. 190 million was expected from assignments and contributions to research activities. Fl. 10 million was obtained from other sources.

In addition to the Central Organization — TNO, there are four special organizations as follows:

- Organization for Industrial Research TNO (Nijverheidsorganisatie TNO) (1935);
- Organization for Nutrition and Food Research TNO (Voedingsorganisatie TNO) (1940);
- National Defence Research Organization TNO (Rijksverdedigingsorganisatie TNO) (1947);
- Organization for Health Research TNO (Gezondheidsorganisatie TNO) (1949).

These bodies administer their own institutes and laboratories, with the Central Organization providing common services in addition to managing its own institutes. The Central Organization also submits the whole TNO budget to the Minister for Science Policy.

The special organizations are governed by Boards whose members are appointed by the Crown on the recommendation of the heads of the various Ministries. The members cover three major categories, namely:

- Government;
- the scientific community;
- the sectors of society in general served by that organization.

The Government representatives have the right of veto, which in practice is seldom used. The Board of the Central Organization includes the Chairmen of the four special organizations.

TNO has no organization which exclusively performs agricultural R & D. But it does have a National Council for Agricultural Research (Nationale Raad voor Landbouwkundig Onderzoek — NRLO). The task of NRLO is to provide a liaison and encourage cooperation between the major agriculture research organizations.

The individual institutes of the TNO also have advisory committees which are constituted on a tripartite basis (government, academics, social interest groups).

The Science Budget (5) for 1979 contains the following passage:

"A certain changeover is necessary if the TNO's potential is to be exploited to the full. This change must inter alia be designed to improve integration between (a) research related to technological development and the renewal of products and processes and (b) research related to other social objectives such as environmental protection, health, energy and raw material savings."

Proposals for this reorganization, which are at an advanced stage, relate to the organizational and financial structures of TNO.

9. The Organization for the Advancement of Pure Research (ZWO)

The Organization for the Advancement of Pure Research (Nederlandse Organisatie voor Zuiver Wetenschappelijk Onderzoek — ZWO) was set up in 1950. It is the equivalent body to TNO in the field of fundamental research. Its functions are to:

- give advice to the Minister of Education and Science on the promotion and coordination of fundamental research;
- promote fundamental research in every science field, inside and outside universities and coordinate such research by all useful means, particularly the distribution of funds.

ZWO's operational expenditure in 1978 totalled some Fl. 160 million, i.e. less than half of that of the TNO. The ZWO is administered by a Council for Pure Scientific Research, a Board and its Director. The Director is Secretary to the Council which is made up of representatives from each university, together with five members not in the academic sphere and up to six members appointed by the Minister. The Board is drawn from the membership of the Council and manages ZWO as directed by the Council. The Minister for Education and Science has the right to overrule both the Council and the Board. The Minister of Finance has a right to be represented on both bodies. The Minister for Science Policy is represented on the Council and the Board of the ZWO which comes under the Minister for Education and Science. The allocation of the ZWO's funds and the framing of policy on cash flow is decided in conjunction with the Minister for Science Policy.

The ZWO contracts out its R & D work largely to foundations which have themselves been set up by ZWO. These foundations are:

- the Foundation for Fundamental Research on Matter (Stichting voor Fundamenteel Onderzoek der Materie — FOM);
- the Foundation for Chemical Research (Stichting Scheikundig Onderzoek in Nederland — SON);

- the Foundation for the Mathematical Centre for Biological Research (Stichting Mathematisch Centrum voor Biologisch Onderzoek - (BION);
- the Foundation for Radio-astronomy (Stichting Radio-Straling van Zon en Melkweg — RZM);
- the Foundation for Medical Research (Stichting voor Fundamenteel Geneeskundig Onderzoek — FUNGO);
- the Foundation for Biophysics;
- the Foundation for Psychonomics;

The FOM is by far the largest and accounts for over half of ZWO's expenditure.

10. The Royal Netherlands Academy of Science and Letters (KNAW)

The Academy (Koninklijke Nederlandse Academie van de Wetenschappen) dates from 1808. Although financed by the state, it is independent. It advises the Government about research of a more academic kind. The Academy is particularly concerned with interdisciplinary projects and with encouraging Government support where it sees the need.

The Academy has a present membership of about 80, of which 50 come from the universities and the remaining 30 from industry and Government.

The KNAW manages a number of basic research institutes.

The Trip Memorandum of 1974 on Science Policy (4) recommended that the KNAW and the ZWO should be brought together in a single new organization to be known as the Council for Pure Scientific Research (Raad voor Wetenschappelijk Onderzoek — RWO). This proposal is still under examination.

11. Netherlands University Council

The Netherlands University Council (de Academische Raad) has acted as spokesman on behalf of the universities since 1961. Each of the 13 universities appoints three members annually and has one vote. Ten more members are appointed for four years by the Crown and the Chairmen and Vice-Chairmen are also appointed by the Crown, for four years, as recommended by the members. The Council is free to work and to make decisions and recommendations autonomously.

12. Other Advisory Bodies

There are four specialized advisory councils, three of which deal with nuclear policy. These are:

- the Central Council for Nuclear Energy (Centrale Raad voor de Kernenergie — CRK);
- the Industrial Council for Nuclear Energy (Industriële Raad voor de Kernenergie — IRK);
- the Scientific Council for Nuclear Energy (Wetenschappelijke Raad voor de Kernenergie — WRK);
- the Health Council (Gezondheidsraad).

13. Industrial R & D

In view of the large private sector involvement, the Government regards responsibility for industrial R & D as lying primarily with industry itself. The Government's role is largely concerned with the creation of a favourable climate through selective support measures. Government assistance can take the form of direct support, subsidies, development credits, or help from specialized research organizations.

In addition to its annual grant, the Central Organization TNO receives additional funds from the Government which are specifically earmarked for the Organization for Industrial Research TNO, in order to promote the cooperation between that organization and industry.

The "Development Credit" system whose resources totalled Fl. 60 million in 1978 is one of the financial instruments operated by the Ministry of Economic Affairs. It is administered through a special body composed of three independent experts. Under the scheme, a maximum contribution of 70% of the total cost of the development phase of a project is made. It does not finance the research work which comes beforehand or the production stage which comes afterwards. "Development Credits" are granted where:

- the project is of sufficient general economic interest;
- there exists a reasonable possibility of technical and economic success;
- it can be shown that the project could not be carried out or would be seriously delayed without the Development Credits;
- the project involves elements which can be regarded as the original contribution to the relevant state of technology in the Netherlands;
- the firms are capable of directing the finance into production.

Development Credits are repayable with 5% interest where the project is successful.

The Ministry for Economic Affairs has a second instrument in the form of "large development credits". This is a temporary instrument which was introduced recently to assist major industrial projects costing more than Fl. 20 million. The Total funds available in 1978 and 1979 were respectively Fl. 50 million and Fl. 25 million. The eligibility requirements are more stringent than for standard development credits.

The *Project for Industrial Innovation* (PII) is a third instrument. The project which was launched in 1977 is designed to assist small industrial undertakings in developing their own innovation strategy, with particular emphasis on transforming knowledge and ideas into genuine innovations. The first phase was confined to approximately 10 undertakings. The second phase, which is scheduled to start in 1979, will involve approximately 100 undertakings.

The 1980 Budget provides for a significant increase in funds for technological renewal.

14. Agricultural Research

The following types of research organization are engaged in R & D in agriculture:

- research institutions under the Ministry of Agriculture;
- research institutions under TNO;
- the agricultural University of Wageningen;
- the veterinary faculty of the University of Utrecht.

The Ministry of Agriculture finances over 30 institutes and 9 experimental stations and subsidizes a number of privately-run field-stations.

These institutes have Advisory Committees in which farmers, trade, industry, universities, extension services and Government Ministries are represented.

These research organizations have their own organizational instruments for coordination and management. Lack of space precludes further detail as regards the latter. They operate jointly within the National Council for Agricultural Research (see 8), where, in conjunction with the various Government bodies and groups of users, they try to achieve an adequate research policy. Systematic attention is given to:

- optimization of the interplay between research workers and the interested parties in connection with research results;
- improving the quality of research;
- maximum effectiveness in carrying out research;
- a democratic approach to the framing of research policy.

15. Health Research

Responsibility for Government research in the public health sector lies with four types of institutions:

- the Ministry of Public Health and Environmental Hygiene;
- the institutes of the Organization for Health Research TNO;
- some institutes of the KNAW;
- university and hospital laboratories.

There are two advisory bodies in the field: the Medical Scientific Research Council (a sub-body of the KNAW) and the Council for Health Research of the TNO.

16. Research on Aerospace

Aerospace research is undertaken by the National Research Laboratory (Nationaal Lucht- en Ruimtevaart-laboratorium — NLR). The Netherlands Agency for Aerospace (Nederlands Instituut voor Vliegtuig- en Ruimtevaartontwikkeling — NIVR) has a coordinating and financing role

17. Energy Research

In 1974 the Ministry for Science Policy set up the National Steering Committee for Energy Research (LSEO). The LSEO has made a significant contribution to the National Programme for out-line Energy Research. An additional allocation of Fl.114 million has been set aside for the 1976-1981 period. When the programme was established, the Government also decided that the LSEO would be succeeded by a Council for Energy Research (REO).

The main research institutes in the Netherlands are the Centre for Energy Research (ECN) which has a staff of 900, and the TNO. A number of other bodies are also engaged in energy research.

18. Proposals for Sector Councils

One of the proposals which emerged from the detailed review of science policy in the Netherlands published in 1974 (Trip Memorandum) (4) was for the creation of National Sector Councils for each of the major areas of non-university research (e.g. agriculture, public health, maritime R & D).

The Sector Councils would be set up by the ministers responsible, in consultation with the Minister of Science Policy. The Sector Councils would be allowed to set up Sub-Councils for separate areas within their sectors. The Councils whose composition would vary from sector to sector would be made up of representatives of three major categories:

- 1) Science; Representatives of the research bodies in the sector concerned (possible also researchers from universities and higher education institutes) and scientific researchers;
- 2) Users of R & D (i.e. central and local Government, industrial producers of goods and services, and "household" consumers);
- 3) Government; Representatives of the Ministries concerned and the Ministry of Science Policy.

The structure of the proposed Councils is shown in Illustration I.

The duties of the Sectoral Councils will involve:

- advising the competent specialist ministers on the policy to be pursued on research in the relevant sector as a whole. Specific account is taken of (a) industry and business life in the area in question and (b) research being carried on abroad;
- advice takes inter alia the form of outline pluriannual reports drawn up by the Sectoral Councils on the basis of policy proposals submitted by departments, research institutes or organizations and social organizations etc., policy proposals, pluriannual plans or proposals in regard to policy orientated research — subsidized by the State — in the relevant sector;
- the promotion, within the framework of its advisory duties, of consultation between the interested parties on the coordination of research plans or programmes;

- giving the competent specialist ministers and the Minister for Science Policy advice about national programmes for the area concerned, in consultation with other bodies;

- conducting project registration.

It is proposed to run on the following lines:

- the research institution submits its draft pluriannual programme to the appropriate Sector Council;
- The Sector Council drafts a comprehensive plan for the entire sector;
- this outline pluriannual plan is forwarded to the responsible minister who adopts it in conjunction with the ministers concerned and the Minister for Science Policy;
- on this basis the research institute finalizes its pluriannual programme. It submits its annual work programme and draft budget to the minister or ministers responsible;
- on the basis of the sectoral pluriannual plan, the ministers determine the grant-in-aid and the associated conditions, and the research institute then adopts its final budget and work schedule;
- the research institutes submit annual reports.

The Government feels that adaptation of the existing structure to the concept of Sector Councils still requires considerable study.

In 1976 and 1977, two preliminary Sector Councils were set up. These were:

- the Preliminary Advisory Council of Research on the Built Environment (Voorlopige Raad van Advies met betrekking tot het Onderzoek van de Gebouwde Omgeving — VRA — OGO);
- the Preliminary Advisory Council for Scientific Research on Development Cooperation (Voorlopige Raad van Advies voor het Wetenschappelijk Onderzoek in het kader van de Ontwikkelings-samenwerking — RAWOO).

The National Council for Agricultural Research (NRLO) also has many of the features of a Sector Council (e.g. tripartite membership). It is proposed to establish a Council for Energy Research for the energy sector (cf. REO (17)). Consideration is also being given to establishing Sectoral Councils in a number of other areas.

19. Comments

The research system in the Netherlands is a compromise between the conflicting concepts of the "centralized" model (where a single ministry has total responsibility for science policy and research) and the "pluralist" model (where responsibility for research lies fully with the sectoral ministries). The "concerted-action" model which has been followed in the Netherlands as a middle ground is not, however, static. There has been a progressive strengthening of the role of the Ministry for Science Policy, gradually shifting the system towards greater coordination.

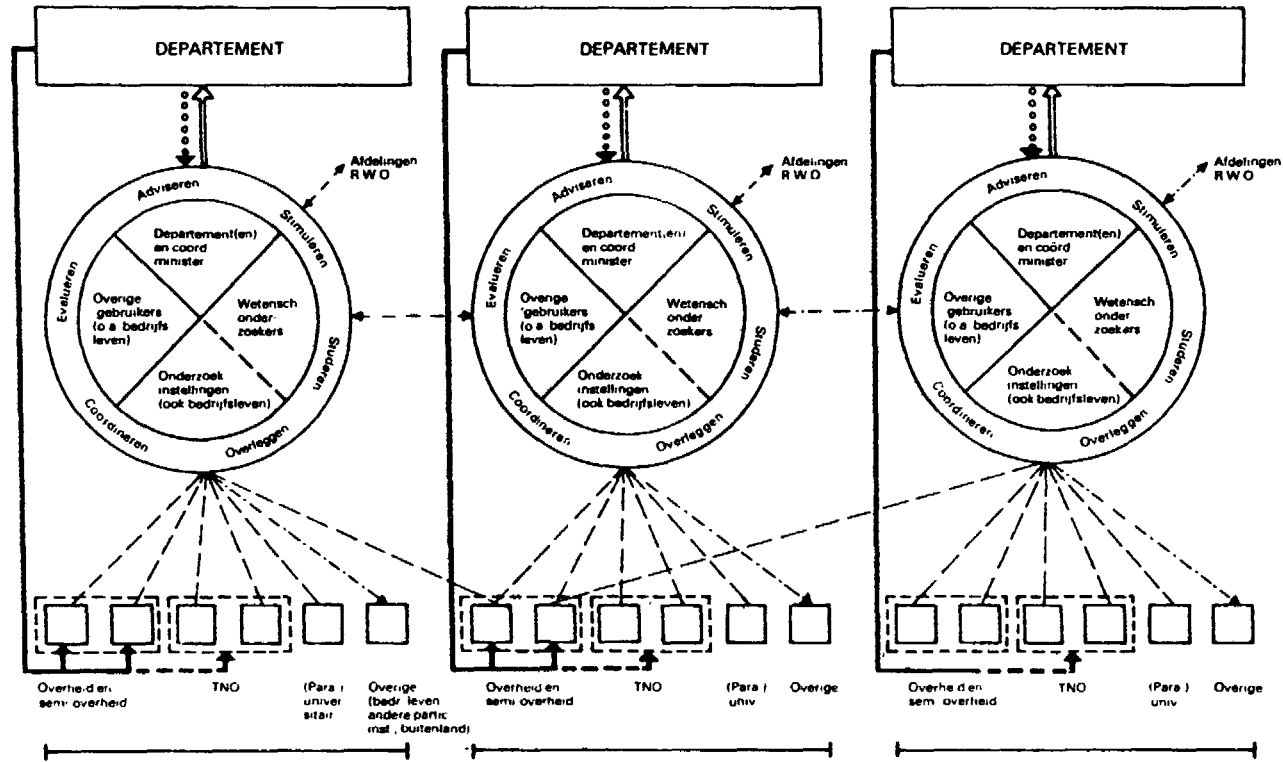
SECTORRADEN IN NEDERLAND — VOORGESTELDE STRUCTUUR

Departementen
verantwoordelijk voor
maatschappelijke
aandachtsgebieden

SECTORRADEN
(met evt onderraden)

ONDERZOEK
INSTELLINGEN

MAATSCHAPPELIJKE
AANDACHTSGEBIEDEN



- = Beleidsbeslissingen/begrotingen
- = Beleidsbeslissingen/toerekening
- = Beleidsvoornemens
- = Plannen/adviezen
- = Coordinatie planning en programmering/overleg
- = Overleg

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Bron (4)

FIGUUR 1

The proposal for National Sector Councils in the Netherlands (see 17) is of particular relevance to the question of involving R & D "user" interests in the Community system. Further study of the possible practical advantages and drawbacks of such an instrument at Community level might, therefore, be appropriate.

The Sectoral Councils would have the major advantage of formally involving the different users of R & D in the institutional framework alongside research workers, research institutions and Government representatives. The model could be of relevance when

considering the representation of the various categories of users in connection with R & D being carried out at Community level. On the other hand, the interests to be represented will vary considerably between different sectors. In the Netherlands this has, to a certain extent, already been recognized in proposing flexible membership. The RAWB, commenting on the proposal, has argued that Sectoral Councils would not be suitable for research management (selection of contractors, drawing up of contracts, monitoring of work) particularly for industrial and technological R & D. The RAWB however, approve the idea of a tripartite review of the content of research programmes

BIBLIOGRAPHY

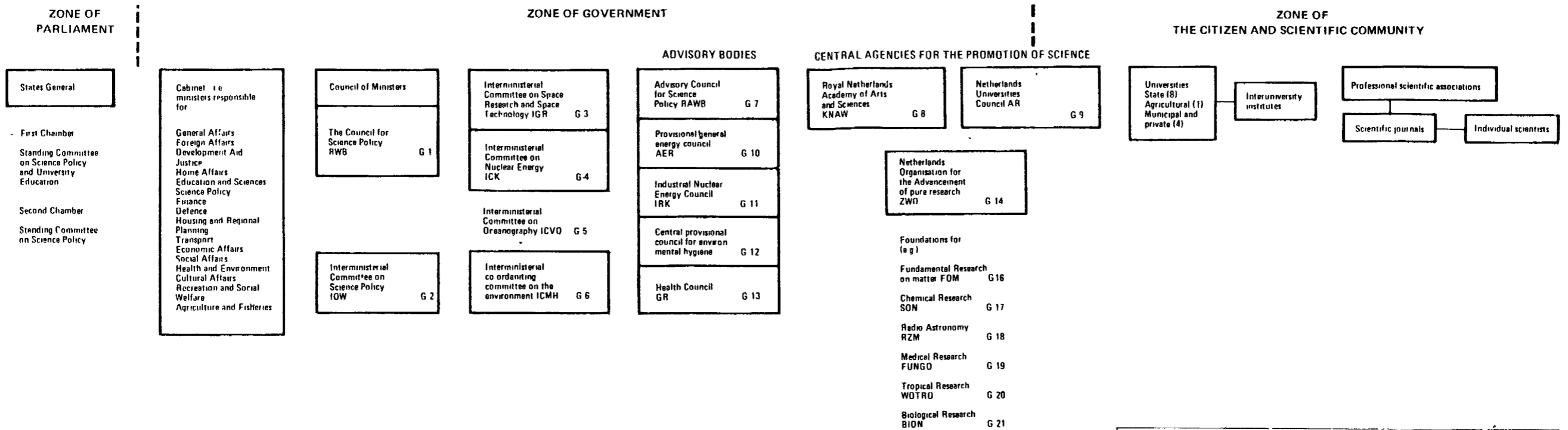
1. *Reviews of National Science Policy — Netherlands*, OECD, Paris, 1973.
 2. *Évolution des priorités de la recherche publique — Étude expérimentale des changements intervenus dans les objectifs des gouvernements dans 12 pays de l'OCDE de 1961 à 1972*, OECD, Paris, 1975.
 3. *Government Financing of R & D 1970-1978*, Statistical Office of the European Communities, Brussels-Luxembourg, 1978.
 4. *Nota Wetenschapsbeleid* presented to Parliament on 16 December 1974 by the Minister of Science Policy, Mr F.H.P. TRIP (Gedrukte stukken Tweede Kamer 13221 nr 1).
 5. *Wetenschapsbudget 1979 — Meerjarenplan voor Wetenschapsbeoefening (+ bijlagen)*, Ministry of Science Policy, 1978.
 6. *National Science and Technology Policies in Europe and North America 1978 — Present State and Future Outlook*, Doc. UNESCO/MINESPOL II/5 to become No. 43 in series "Science Policy Studies and Documents", UNESCO, Paris, 1979.
 7. Raad van Advies voor het Wetenschapsbeleid *Jaaradvies 1979*, and various *Opinions 1969-1978*.
 8. *Nota Sectorraden Wetenschapsbeleid*, Ministry of Science Policy, 1977.
 9. Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek, *Annual Reports*
 10. *Taken en bevoegdheden Minister voor Wetenschapsbeleid*, Letter from the Prime Minister to Parliament, 5 September 1978. (Gedrukte stukken Tweede Kamer 15148 nr 1).
 11. European Communities, "*Comparison of national and Community policies on R & D — The Netherlands*" (COPOL 79), Brussels, 24/25 April 1979 (doc. CREST 1210/79).
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SCHEDULE I

**PUBLIC R & D EXPENDITURE
IN THE NETHERLANDS — 1978**

Heading	Netherlands			EEC %
	M Fl	M. EUA	%	
1. Exploration and exploitation of the earth and its atmosphere	19.5	7.2	0.7	2.0
2. Planning of human environment	181.1	66.5	6.5	3.4
3. Protection and improvement of human health	209.6	77.0	7.5	5.4
4. Production, distribution and rational use of energy	114.7	42.1	4.1	11.6
5. Agricultural productivity and technology	217.4	79.8	7.8	3.7
6. Industrial productivity and technology	142.7	52.4	5.1	8.2
7. Social and sociological problems	167.0	61.3	6.0	3.2
8. Exploration and exploitation of space	100.5	36.9	3.6	4.4
9. Defence	95.1	34.9	3.4	22.3
10. General promotion of knowledge	1 534.8	563.5	55.0	35.5
Not itemized	8.1	3.0	0.3	0.3
TOTAL	2 790.5	1 024.6	100.0	100.0

Source. Statistical Office of the European Communities (3).



GLOSSARY

G 1	The Council for Science Policy	Raad voor het Wetenschapsbeleid RWB		
	Interministerial committees			
G 2	Interministerial committee on Science Policy	Interdepartementaal Overleg voor het Wetenschapsbeleid IOW		
G 3	Interministerial Committee on space research & space technology	Interdepartementale Commissie voor Ruimte-onderzoek en ruimte technologie ICR		
G 4	Interministerial Committee on nuclear energy	Interdepartementale Commissie voor kernenergie ICK		
G 5	Interministerial Committee on oceanography	Interdepartementale Commissie voor Oceanografie ICVO		
G 6	Interministerial co-ordinating committee on the environment	Interdepartementale coördinatie Commissie voor Milieuhygiene ICMH		
	Advisory bodies of the government			
G 7	Advisory Council for Science Policy RAWB	Raad van Advies voor het Wetenschapsbeleid RAWB		
G 8	Royal Netherlands Academy of Arts and Sciences	Koninklijke Nederlandse Academie van Wetenschappen KNAW		
G 9	Netherlands Universities Council	Academische Raad AR		
G 10	Provisional general energy Council	Voorlopige algemene energieraad AER		
G 11	Industrial nuclear energy council	Industriële raad voor de kernenergie IRK		
G 12	Central provisional council for environmental hygiene	Voorlopige centrale raad voor de milieuhygiene		
G 13	Health Council	Gezondheidsraad		
	Organizing and financing bodies			
G 14	Netherlands organization for the advancement of pure research	Nederlandse organisatie voor zuiver wetenschappelijk onderzoek ZWO		
G 15	Netherlands Organization for applied scientific research	Nederlandse organisatie voor toegepast natuurwetenschappelijk onderzoek TNO		
	Executive bodies and institutes of above mentioned organizations			
G 16	Netherlands foundation for fundamental research on matter	Stichting fundamenteel onderzoek der materie FOM		
G 17	Netherlands foundation for chemical research	Stichting scheikundig onderzoek in Nederland SON		
G 18	Radio observatory, Netherlands foundation for radio astronomy	Radio sterrewacht stichting radiostraling en ruimtevaart H.Z.M.		
G 19	Netherlands foundation for fundamental medical research	Stichting fundamenteel geneeskundig onderzoek FUNGO		
G 20	Netherlands foundation for the advancement of tropical research	Stichting voor wetenschappelijk onderzoek van de tropen WOTRO		
G 21	Netherlands foundation for biological research	Stichting voor biologisch onderzoek BION		
			<i>Bron (1)</i>	
			TNO research institutes	
G 22	Central organisation for applied research in the Netherlands	Centrale organisatie TNO		
G 23	National council for agricultural research TNO	Nationale raad voor landbouwkundig onderzoek TNO		
G 24	Council for Health research TNO	Gezondheidsorganisatie TNO		
G 25	Council for Environmental research TNO	Organisatie voor Milieuhygiene TNO		
G 26	Committee for Traffic research TNO	Verkeersorganisatie TNO		
G 27	Organisation for industrial research TNO	Nijverheidsorganisatie NO TNO		
G 28	Organisation for nutrition and food research TNO	Voedingsorganisatie TNO		
G 29	National defence research organisation TNO	Rijkverdedigingsorganisatie TVO TNO		
G 30	Organisation for health research TNO	Gezondheidsorganisatie GO TNO		
			Some other important research bodies and institutes	
G 31	State institute of public health	Rijksinstituut voor de volksgezondheid		
G 32	Research Institute for Nature	Organisatie voor Natuurbeheer		
G 33	Royal Netherlands Meteorological institute	Koninklijk Nederlands meteorologisch instituut KNMI		
G 34	Netherlands Energy Centre	Energie centrum Nederland ECN		
G 35	National aerospace laboratory	Nationaal lucht en ruimtevaart laboratorium NLR		
G 36	Laboratory for hydraulic engineering	Waterloopkundig laboratorium		
G 37	Netherlands institute for sea research	Nederlands instituut voor onderzoek der zee NIOZ		
G 38	Netherlands ship model basin	Nederlands scheepsbouwkundig proefstation		
			Some other important financing bodies	
G 39	Netherlands agency for aerospace programs	Nederlands instituut voor vliegtuigontwikkeling en ruimtevaart NIVR		
G 40	Foundation for educational research	Stichting voor onderzoek van het onderwijs SVO		
G 41	Netherlands foundation cardio vascular diseases	Nederlandse stichting tot bestrijding van hart- en vaatziekten		

RESEARCH ESTABLISHMENTS

Netherlands Organisation for Applied Scientific Research TNO	G 15		
TNO Central Organisation	G 22		
TNO National Council for agricultural research	G 23		
TNO Council for Health research	G 24		
TNO Committee on Environmental research	G 25		
TNO Committee for Traffic research	G 26		
TNO Organisation for industrial research	G 27		
TNO Organisation for Nutrition and food research	G 28		
TNO National defence research organisation	G 29		
TNO Organisation for health research	G 30		
			Mixed research institutes
		a) TNO research institutes	
		i) general (dependent on TNO central organisation)	G 22
		ii) specialised	
		agriculture	G 23
		industry	G 27
		nutrition	G 28
		defence	G 29
		health	G 30
		b) Netherlands Energy Centre ECN	G 34
		National Aeronautical and Space laboratory NLR	G 35
		Hydraulic Laboratory WL	G 36
			Non-governmental research institutes
		A Royal Academy Institutes	G 8
		B Institutes for the various ZWO foundations	G 16/G 21
		C Netherlands institute for sea research NIOZ	G 37
		Netherlands ship model basin	G 38
			State research institutes e.g.
		State Institute of Public Health RIVM	G 31
		Research Institute for Nature Management RIN	G 32
		Royal Netherlands Meteorological Institute KNMI	G 33
			Some other important financing bodies
		Netherlands agency for aerospace programs NIVR	G 39
		Foundation for educational research SVO	G 40
		Netherlands foundation cardio vascular diseases	G 41

Netherlands
National S & T policy structures and mechanisms

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UNITED KINGDOM

RESEARCH AND DEVELOPMENT — UNITED KINGDOM

1. Introduction

In 1978, the United Kingdom Government spent some £1,687 million (2490 million EUA) on research and development. Public R & D expenditure in 1977 amounted to about 2.8% of the total Government budget. This was equivalent to almost 1.2% of GDP. The pattern of expenditure diverges from the other Member States, particularly on Defence which accounted for over 50% of the total public R & D budget in 1977. The only other Member State in the Community devoting a substantial share of its R & D budget to Defence is France, where the figure is 30%. Largely as a result of this figure, the shares allocated to most of the other headings (Earth, Environment, Health, Energy, Industry, Sociological Problems, Space and the General Promotion of Knowledge) are below average for the European Community as a whole. Agricultural R & D on the other hand has a higher than average share in real terms; overall public R & D expenditure has been more or less static since 1970. A breakdown of public R & D expenditure in 1978, by major objective is given in SCHEDULE I.

The United Kingdom has a long history of involvement in the field of science and technology. The principal milestones were:

- 1660 The Royal Society of London
- 1675 The Royal Observatory in Greenwich
- 1842 Laboratory of the Government Chemist
- 1900 The National Physical Laboratory
- 1916 The Department of Scientific and Industrial Research (since replaced)
- 1920 The Medical Research Council
- 1947 Advisory Council on Scientific Policy (since replaced)
- 1954 United Kingdom Atomic Energy Authority
- 1964 Creation of the Department of Education and Science (DES)
- 1965 Passing of the Science and Technology Act.

This historical development has given rise to a complex organizational structure in the science field. R & D is carried out by Government research establishments, universities, independent and grant-aided bodies, public corporations and private industry. These organizations differ greatly in size, structure, funding and approach.

2. The Institutional Framework

The main bodies involved in the drawing up and carrying out of Government science policy in the United Kingdom are shown in SCHEDULE II.

Responsibility for Government R & D rests unequivocally with individual Government Ministries. This principle was reaffirmed in the Government's White Paper of 1972 entitled "Framework for Government Research and Development" (1).

The paper stated that "objectives are assessed by the Cabinet, and Ministers are responsible through Parliament to the Community as a whole for seeing that they are attained". But it went on to specify that "decisions about the research and development required to support national economic and social policies must rest with the Ministers who have responsibility for those policies". "Applied research and development are necessary to achieve many of the Government's objectives but they cannot be regarded as forming a distinct function of government. Any attempt to formulate overall objectives for a supposed collective activity of research and development would lead to confusion". There is thus little emphasis on institutionalized coordination of Government science policy below the level of the Cabinet itself.

The Government Departments which account for the bulk of R & D are Defence, Science and Education, Energy, Industry, Environment, Agriculture, Fisheries and Food and Health Social Services. Many of the other Departments are also responsible for R & D activities of one kind or another. These include the Department of Prices and Consumer Protection and the Ministry for Overseas Development. A description of the organization of research activities and institutions under the principal Government Departments concerned with civil R & D is given in the following sections.

The arrangements for fundamental research are quite distinctive from those for applied R & D. Under the "Haldane Doctrine" which was put forward in 1918, such research is separated from departmental political control. This has led to the Research Council system which is described in section 10.

R & D work is also carried out by a large number of organizations, such as the Research Associations, which are private bodies funded from a wide variety of sources, in some cases still funded partly or wholly by the Government.

3. Central Coordination of Government R & D Policy

Coordination of Government policy on R & D at Cabinet level is ensured through the Committee of Departmental Chief Scientists and Permanent Secretaries. It is chaired by the Secretary to the Cabinet. Political responsibility for the coordinating machinery lies with the Lord Privy Seal.

In recent years, the Central Policy Review Staff (CPRS) which is part of the Cabinet Office (i.e. under the Prime Minister) has played an increasing role in helping the Government to determine policy priorities. The Chief Scientist is a member of the CPRS, which provides ministers with the concerted advice of the different Government Departments on, inter alia, the scientific and technical aspects of Government policy.

- The CPRS is represented on two advisory bodies:
- The Advisory Committee on Applied Research and Development (ACARD)
 - The Advisory Board for the Research Councils (see section 13);

4. The Advisory Council on Applied Research and Development (ACARD)

The Advisory Council on Applied Research and Development (ACARD) was set up to advise ministers and to publish reports as necessary on:

- applied R&D in the United Kingdom and its deployment in both the public and private sectors in accordance with national needs;
- the articulation of this R&D with scientific research supported through the Department of Education and Science;
- the future development and application of technology;
- the role of the United Kingdom in international collaboration in the field of applied R&D.

The ACARD was set up to improve the interface between Government and outside organizations on applied research matters by monitoring both public and private sector research.

The ACARD is chaired by the Lord Privy Seal. Its membership which is primarily drawn from people with experience relevant to the development of technology, currently includes 6 from the nationalized industries, 6 from private industry, and one from the trade unions.

5. Parliament

The House of Commons (Lower House) has a Select Committee on Science and Technology. Technically, the Committee exists for one Session of Parliament. It was set up for the 1966-1967 Session but has been reconstituted at each Session since. The Committee which is composed of 15 members from the different political parties was given broad terms of reference i.e. "to consider science and technology and to report thereon from time to time".

There is also a Parliamentary and Scientific Committee which was created in 1939 as a forum for the exchange of views between members of Parliament and scientists. It is an informal body whose membership is open to both houses of Parliament.

6. Government Departments — The "Customer/Contractor" principle

The Government's White Paper of July 1972 (1) proposed a number of institutional reforms, which had earlier been suggested in reports by Lord ROTH-SCHILD and Sir Frederick DANTON. The principal suggestion was that applied research and development commissioned by the Government should be organized in accordance with a "Customer/Contractor" principle, so as to ensure that the best use was made of

Government funds. The customers of R&D work (i.e. Government Departments, Research Councils, Industry, etc.) define their requirements in the clearest possible terms. They then select a contractor (i.e. research establishment). The contractor advises on the feasibility of meeting the requirements set and undertakes the work, for which he is paid by the customer. The arrangements agreed between the two parties must ensure that the objectives remain attainable within reasonable cost.

Each Government Department was instructed to apply this principle to its R&D activities. The "Customer/Contractor" principle has had a major influence on the organization of R&D in the different Government Departments in recent years. The Departments have nevertheless tended to adapt the principle to fit the type of R&D being carried out within their own area. There is thus no single organizational model. Examples of the arrangements in some of the principal Government Departments are given in the following sections.

7. The Department of Industry-Requirement Boards

The Department of Industry spends over £100 million annually on R&D. A significant proportion goes directly to work in areas such as civil aircraft and space technology. But about 40% of the total is allocated to other industrial R&D projects through Requirement Boards set up by the Department in application of the "Customer/Contractor" principle

- There are nine Requirement Boards dealing with
- Chemicals and Minerals
 - Computers, Systems and Electronics
 - Engineering materials
 - Garment and Allied Industries
 - Mechanical Engineering and Machine tools
 - Metrology and Standards
 - Ship and Marine Technology
 - Electrical Technology
 - Chief Scientist's.

The latter covers long-term requirements and areas which fall outside the remit of the other Boards.

The Boards' main functions are to:

"determine subject to the agreement of ministers, the objectives and balance of Department of Industry funded R&D as proxy customers, to further the practical application of technology and to advise the Minister on other matters relating to science and technology within the Boards' field of interest".

In practice, this means that the Boards:

- define R&D strategy within the sector for which they are responsible and provide a technological input to the Government's industrial strategy programme;
- examine applications from potential contractors (commercial firms, industrial research associations, Government Research Establishment, etc.):

- assess the proposals in the light of criteria such as:
 - relevance to industrial needs;
 - relevance to Government objectives within that field;
 - cost;
 - timing;
 - feasibility of technical success;
 - capability of the contractor to execute successfully;
 - market prospects for the likely end product;
 - contribution to industrial competitiveness and balance of payments;
 - reduction of pollution;
 - materials and energy conservation;
- endorse or reject schemes and indicate the preferred contractor for the work;
- examine contractual arrangements for cost-sharing and for repayment in the event of successful outcome;
- monitor the progress of R & D work approved and measures taken to communicate the results;
- review all other technical aspects effecting their sectors including the avoidance of duplication, the licencing-in of technology, international developments, academic and industrial training of engineers.

Legally, the Boards merely advise the Government Department, with the latter retaining decision-making and financial responsibility. In practice, however, the Requirement Boards are executive and play an effective decision-making role.

The size of the Boards varies from case to case. In general, there are 10 to 16 members. A typical board would have the following composition:

Industrialists (contractors, users and consultants)	7
Academics	3
Government Officials	4
	<hr/>
TOTAL	14

Members are selected by the Minister so as to represent the broadest cross-section of users' interests. They are appointed in a personal capacity for a fixed period of office. The Chairman of the Board, who plays an important role in its proceedings, is usually an industrialist of standing. Secretariat and supporting services are provided by the Government Department. The Boards meet about six times a year.

Where necessary, they have sub-committees to deal with specialized sectors. For instance, the Computers, Systems and Electronics Requirement Board has three groups on Computing, Electronics and Control Engineering and Instruments. The Ship and Marine Technology Requirement Board also has a Ship Sub-Committee, and a Sub-Committee on Marine Technology.

In 1976/1977 total estimated expenditure by the Boards was 64 million EUA (£43 m.). Of this 37 million EUA (£25 m.) was allocated to the Government's own Capital Research Establishments, with the remaining 27 million EUA (£18 m.) going to other bodies. Requirement Boards are thus responsible for both "direct" and "indirect" actions. In theory, at least, the Government Research Establishments compete with other bodies in bidding for support for projects. In practice, it is in the allocation of funds to outside bodies (i.e. "indirect actions") that the Boards play a really determinant role.

The breakdown of the Department of Industry's R & D Funds between the Requirement Boards is negotiated within the Department between representatives of the Boards concerned.

8. The National Research Development Corporation (NRDC)

The National Research Development Corporation (NRDC) is an independent public body set up in 1949 under the Department of Industry to promote the adoption by industry of new products and processes invented in Government laboratories, universities and elsewhere.

The NDRC is financed by loans from the Department of Industry. It operates commercially and seeks a return on its investment. It helps to finance the investment necessary to bring projects with reasonable prospects to a commercially viable stage. In 1977 the NRDC authorized £8.3 million for development projects. At the end of 1977, there were 150 projects in existence costing a total of £34 million.

9. The Department of Energy

The Department, which was set up in 1974, is responsible for R & D connected with the supply and use of all forms of energy. Its R & D activities cover five areas:

- civil nuclear development;
- exploration and exploitation of offshore hydrocarbons;
- strategic oversight of R & D work of nationalized energy industries (coal, electricity, gas);
- research into novel sources of energy,
- coordination of energy research within Government departments.

The Department has three important advisory bodies, namely:

- the Advisory Council on Energy Conservation (ACEC);
- the Advisory Council on R & D for Fuel and Power;
- The Offshore Energy Technology Board (OETB).

The Advisory Council on Energy Conservation provides the Secretary of State for Energy with advice on the promotion of economy and efficiency in energy consumption. The Council comprises a

Chairman, 18 members and 5 assessors. The members are selected from public and private enterprise, the universities and other associations. The assessors come from different Government Departments concerned with the subject. The Council has established teams and working groups to examine particular aspects of energy conservation.

The Advisory Council on R & D for Fuel and Power advises the Secretary of State for energy on the general programme of R & D of the public enterprises working in the energy field. It also provides advice on other matters which may be referred to it by the Secretary of State.

The Offshore Energy Technology Board is drawn up on the same lines as the Requirement Boards of the Department of Industry. It is constituted as an advisory body so as to ensure that decisions conform to the broader objectives of Government policy for offshore hydrocarbons development. Its tasks include identification of areas which will most benefit by Government R & D, provision of advice on the objectives, priorities and balance of R & D programmes and the review of progress of the work. The Board had a membership of 15 in 1976 (7 from the oil and gas industry, 6 from Government Departments and 2 from universities and research bodies).

10. The Department of the Environment

The Department carries out R & D directly, in its own establishments, and indirectly, by contracting out to independent bodies. An organizational description is given in SCHEDULE II.

The Department applies the "Customer/Contractor" principle through a total of 15 Research Requirement Committees. The recommendations of these Committees are passed on to three Programme review Committees which are chaired by the Department's Director-General for research and which determine the final balance of programmes.

There are other bodies which provide the Department with external advice:

- the Planning and Transport Research Advisory Council;
- the Construction and Housing Research Advisory Council;
- the Special Sub-Committee of the Royal Commission on Environmental Pollution.

11. The Ministry of Agriculture, Fisheries and Food (MAFF)

The Ministry is responsible for R & D work in England and Wales. Both Scotland and Northern Ireland have separate Departments which function along the same lines. An organizational description is given in SCHEDULE II. The principal bodies providing advice in the area are:

- a Research Requirement Board on which the Agricultural Research Council (ARC) and the Department of Agriculture and Fisheries for Scotland (DAFS) are represented;
- the Joint Consultative Organization (JCO) which advises the MAFF, DAFS and the ARC on priorities for their research programmes;
- Advisory Council for Agriculture and Horticulture in England and Wales;
- Advisory Council on Fisheries R & D.

12. The Department of Health and Social Security

The Department's work is mainly carried out by the Medical Research Council (MRC). The Chief Scientist of the Department chairs the Chief Scientist's Research Committee (CSRC) which is composed of external experts and advises on the balance of the Department's R & D programmes. The overall composition of the research programmes is determined by the Department's Planning Committee on which the Chief Scientist serves.

The Department also has a number of advisory bodies dealing with particular aspects of its R & D work.

13. The Department of Education and Science — The Research Council System

The Department of Education and Science is responsible, inter alia, for policy regarding the universities and polytechnics and for a large proportion of fundamental R & D work supported by the Government. The universities receive their funds from the Government through the University Grants Committee (UGC), a certain proportion of which are earmarked for R & D work. About two-thirds of the universities' expenditure on scientific and technological research is funded in this way. The Department provides support for civil science and technology through the Research Councils.

There are five Research Councils:

RESEARCH COUNCIL	Estab-lished	Expenditure (1975/1976)
Science Research Council	1965	£ 96 million
Medical Research Council	1920	£ 29 million
Natural Environment Research Council	1965	£ 19 million
Agricultural Research Council	1931	£ 13 million
Social Science Research Council	1965	£ 9 million

The Research Councils support R & D in the following ways:

- post graduate awards at the universities in the form of scholarships, etc.;
- grants for specific research projects in the universities;

- R & D carried out in the Research Councils' own establishments and units;
- grants for R & D in other research institutions.

A more detailed description of the Research Councils is provided in SCHEDULE III.

To strengthen institutional cooperation, an Advisory Board for the Research Councils was established in 1972. It replaced another body which had hitherto fulfilled a somewhat similar function. The Board was given the following terms of reference:

- to advise the Secretary of State on his responsibilities for civil science with particular reference to the Research Council system, its articulation with the universities and Departments, the support of post graduate students and proper balance between international and national scientific activity;
- to advise the Secretary of State on the allocation of the science budget amongst the Science Research Council and other bodies, taking into account funds paid to them by customer departments and the purposes to which funds are devoted;
- to promote close liaison between Councils and the users of their research.

The Board has 21 members drawn from three board groups:

- the chairmen or secretaries of the Research Councils and the UGC;
- the Chief Scientists from the Government Departments concerned;
- independent members from the universities and industry.

14. The Research Associations

There are about 60 privately-constituted Research Associations in the United Kingdom. They provide research — and other services — on a cooperative basis. Firms become members by payment of an annual fee. Most were set up with encouragement from the Government in order to provide technology-improvement, research, consultancy, advisory and information services to member industries. Over 40 receive, or have received, grants or contracts from Government Departments, mainly the Department of Industry, but also the Department of the Environment and the Ministry of Agriculture, Fisheries and Food. In line with the "Customer/Contractor" principle, grants as a method of support have been replaced by contracts for specific programmes. Total support for Research Associations has however increased following this change.

15. Comments

The research system in the United Kingdom is a complex structure which has developed over a long period of time. Over 80% of Government R & D spending is effectively accounted for by three ministries (Ministry of Defence, Department of Education and Science and the Department of Energy). At the same

time, responsibility for the allocation of public R & D funds is heavily devolved on individual ministries, not only for historical reasons, but also as a matter of conscious policy. Government Departments have considerable autonomy with regards to R & D programmes in their area.

To ensure the best use of Government funds, the "Customer/Contractor" principle is applied to all Government R & D. The system seeks to simulate market relationships between both parties. The customer says what he wants. The contractor does it, if he can. The customer pays. Each Government Department has decided how the principle should best be applied to its own work area.

The most notable example of the application of the "Customer/Contractor" principle is the Department of Industry's system of Requirement Boards (see section 4).

A report by the Chairman of the Energy Section of the ESC (11) in 1977 made, inter alia, the following comments on the operation of Requirement Boards:

- 1) Their main advantage is that within a small group exploiters and users of research results are closely associated with decisions, thus helping to make sure that the work meets practical needs and is speedily applied.
- 2) The Boards are, by composition, more suited to the task of efficient R & D project selection and management than to the definition of broader strategy.
- 3) They are best suited to applied research, where requirements can be closely defined, particularly in the case of industrial R & D for which they were specifically set up.
- 4) The Boards are more effective when dealing with indirect actions where they have full discretion than with the direct work of Government Establishments where they have less flexibility in allocating funds.
- 5) The Boards require, and in practice have achieved, a high level of confidentiality and impartiality in their proceedings.
- 6) They require the voluntary commitment of a highly-qualified membership. This is forthcoming where the Requirement Boards are given a concrete executive role.

While the "Customer/Contractor" principle can be applied to all research, Requirement Boards were specifically designed for industrial R & D. The latter requires a well-defined set of research needs. This in turn presupposes that industrial policy aims can be closely identified.

While there is relatively strong involvement by industry in the decision-making process, there has been some criticism in trade union circles at the lack of a central advisory body composed of representatives of the social partners to review the Government's overall R & D effort.

BIBLIOGRAPHY

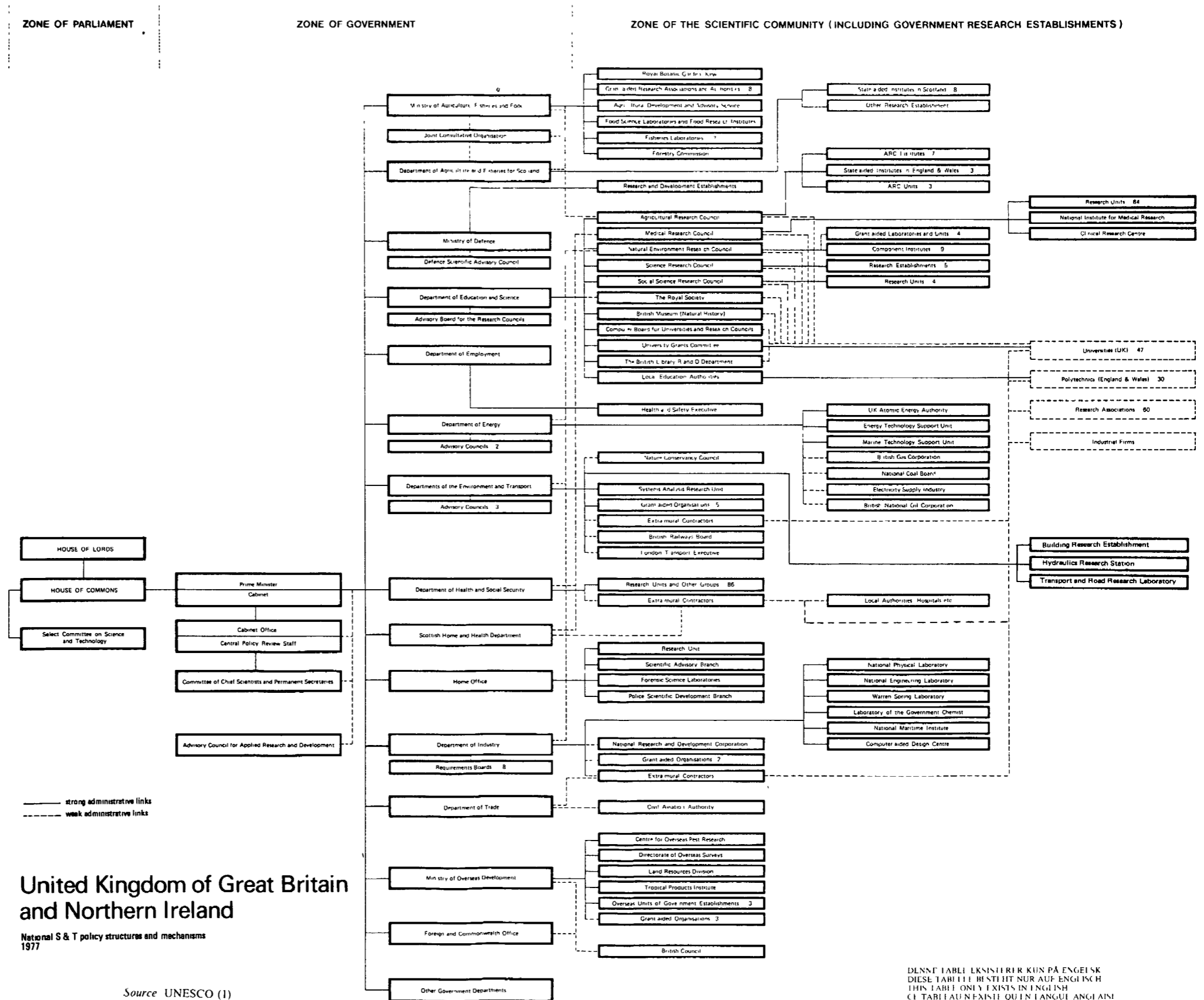
1. *Framework for Government Research and Development*. HMSO, London 1972 (Cmnd. 5046).
 2. *Government Organization of Science and Technology in Britain*, The British Council, London, 1976.
 3. *Reviews of National Science Policy — United Kingdom, Germany*, OECD, Paris, 1977.
 4. *Department of Industry, Research and Development 1974-1976*, HMSO, London, 1977.
 5. *Department of Industry, Research and Development Requirement Boards, Reports 1976-1977*, HMSO, London, 1977.
 6. *Department of Industry, Research Establishments Review 1978*. HMSO, London, 1978.
 7. *Department of Industry, Social Aspects of Innovation and Industrial Technology — A Survey of Research*. HMSO, London, 1976.
 8. *Department of Energy, Report on Research and Development 1975-1976*, HMSO, London, 1976.
 9. *Second Report of the Advisory Board for the Research Councils 1974-1975*, HMSO, London, 1976.
 10. HARVEY, A.P., ed., *Guide to World Science Vol. 1 — United Kingdom*, Guernsey, 1974.
 11. MILLER, W.G.N., *The role of Requirement Boards in the United Kingdom and their possible application to Community Research and Development* (Doc. CES 767/77).
 12. POOLE, P.B., and ANDREWS, K., *The Government of Science in Britain*, Weidenfeld and Nicholson, London, 1972.
 13. European Communities, *Government financing of Research and Development 1970-1978*, Statistical Office of the European Communities, Luxembourg, 1978.
 14. *Department of Energy, Energy Research and Development in the United Kingdom*, HMSO, London, 1978.
 15. *National Science and Technology Policies in Europe and North America 1978 — Present Situation and Future Prospects*, Doc. UNESCO/ MINESPOL II/5, to become No. 43 in series "Science Policy Studies and Documents", UNESCO, 1979.
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SCHEDULE I

**PUBLIC R & D EXPENDITURE
IN THE UNITED KINGDOM — 1978**

Heading	United Kingdom			EEC
	M £	M. EUA	%	%
1. Exploration and exploitation of the earth and its atmosphere	16.7	24.6	1.0	2.0
2. Planning of human environment	38.2	56.3	2.3	3.4
3. Protection and improvement of human health	45.9	67.7	2.7	5.4
4. Production, distribution and rational use of energy	136.8	201.7	8.1	11.6
5. Agricultural productivity and technology	65.7	96.9	3.9	3.7
6. Industrial productivity and technology	81.6	120.3	4.8	8.2
7. Social and sociological problems	17.8	26.2	1.1	3.2
8. Exploration and exploitation of space	42.5	62.7	2.5	4.4
9. Defence	878.6	1 295.6	52.1	22.3
10. General promotion of knowledge	345.6	509.6	20.5	35.5
Not itemized	17.2	25.4	1.0	0.3
TOTAL	1 686.6	2 487.0	100.0	100.0

Source. Statistical Office of the European Communities (13)



SCHEDULE III

THE FIVE RESEARCH COUNCILS

1. Science Research Council (SRC)

The Science Research Council (SRC) was established under the Science and Technology Act in 1965. It covers all fundamental science except that which is the responsibility of the other Research Councils. It promotes research in its own establishments, supports post-graduate studies and purchases and operates equipment.

The SRC is composed of a chairman and up to 15 other members. In planning and carrying out the research programme, the SRC is advised by 4 Boards dealing with specific areas of the work. These are: the Astronomy, Space and Radio Board, the Engineering Board, the Nuclear Physics Board and the Science Board.

The SRC also coordinates the British Scientific Space Research Programme and provides the United Kingdom contribution to the European Organization for Nuclear Research (CERN), the civil science programme of NATO and part of the United Kingdom contribution to the European Space Agency (ESA).

2. The Medical Research Council (MRC)

The Medical Research Council (MRC) was incorporated under the present title by Royal Charter in 1920. Its principal task is to promote research into all aspects of health and disease. The Council supports research in the following forms:

- work by its scientific staff, mostly working in its own establishments;
- short-term grants to workers in universities and elsewhere;
- long-term grants in support of specific research programmes in university departments;
- the fellowships and scholarships tenable both at home and abroad.

The MRC consists of a Chairman, a Deputy Chairman and 14 to 18 other members. At least three-quarters of the members must be scientifically qualified representatives of the different branches of medical knowledge and be actively engaged in research. The MRC is assisted in its work by Advisory Boards, the most important of which are the neurobiology and Mental Health Board, the Cell Biology and Disorders Board, the Physiological Systems and Disorders Board and the Tropical Research Board.

3. The National Environment Research Council (NERC)

The NERC was established under the Science and Technology Act in 1965. It seeks to encourage, plan and execute research in those sciences, physical and biological, that relate to man's natural environment and its resources. The work of NERC covers five broad areas:

- *solid earth*, its physical properties and mineral resources (geology, biophysics and geochemistry);
- *seas and oceans*, their behaviour and living and mineral resources (physical oceanography and marine ecology);
- *terrestrial environments*, wildlife communities and their resources (terrestrial ecology and forestry);
- *atmosphere*, its structure and interactions (some aspects of meteorology);
- *antarctica*, the physical and biological properties of the antarctic environment (life and earth sciences and atmospheric).

The Council carries out research and training through its own institutes, grant-aided institutes and by grants, fellowships and postgraduate awards to universities and other institutes of higher education.

The NERC is composed of a chairman and up to 18 members. The Council has a total of 17 institutes under it.

4. The Agricultural Research Council (ARC)

The Agricultural Research Council (ARC) was established in 1931. The ARC has 8 institutes under its direct control. It is further responsible for 14 independent state-aided agricultural research institutes. It has also established 11 units under distinguished scientists associated with universities. The ARC in addition provides advice on the work of 8 independent institutes financed by the Department of Agriculture and Fisheries for Scotland. The ARC makes special research grants to support promising new lines of work in the university departments.

The ARC has between 19 and 22 members including scientists, farmers and representatives of the Ministers of the Agricultural Departments.

5. The Social Science Research Council (SSRC)

The SSRC was set up in 1965. Its work covers accountancy, criminology, demography, economics, economic and social history, economic and social statistics, education, human geography, industrial relations, management, planning, political science, psychology, psycho-linguistics, public administration, science policy, social anthropology, social forecasting, sociology, legal studies, and socio-linguistics

The SSRC has four research units in which it carries out R & D. Like the other Research Councils it is also advised by a number of specialized Committees of which there are 12.

European Communities — Economic and Social Committee

“The Organization and Management of Community R & D”

Study of the Economic and Social Committee

Brussels: General Secretariat of the Economic and Social Committee

1980 -159pages

DA, DE, EN, FR, IT, NL

The Committee approved this Study, drawn up on its own initiative, which examines the decision-making and management procedures which are currently used for Community sponsored research and development activity and suggests improvements to these procedures. The Study also presents a summary of the position in each of the Member States, but the whole of the Study relates only to R & D funded by the public sector.

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