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Objectives, priorities and
resources for a common
research and development policy

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Objectives, priorities and resources

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Introduction

On 14 January 1974 the Council of the European Communities approved four resolutions designed to promote the development of a common policy on science and technology,¹ thus giving concrete expression to the wishes expressed by the Heads of State or of Government in Paris on 19 and 20 October 1972.²

These resolutions dealt respectively with :

- (a) the coordination of national policies and the definition of projects of Community interest in the field of science and technology;
- (b) the participation of the European Communities in the European Science Foundation;
- (c) an initial programme of action by the European Communities in the field of science and technology;
- (d) a programme of action of the European Communities on forecasting, assessment and methodology.

In this context, the Community is requested to:

- (a) compare and examine national policies;
- (b) identify, analyse and compare the objectives set by Member States;
- (c) select the appropriate ways and means for the implementation of R & D projects of Community interest;
- (d) establish on-going discussions between Member States to work out a common approach to non-member countries or international organizations.

The outcome of the first of the resolutions was the establishment of the Scientific and Technical Research Committee (CREST) with the task of helping Community institutions to define objectives and securing the development of a common policy for science and technology; to this end, it is clearly essential that there should be coordination of national policies in this field and joint formulation and implementation of scientific research and technological development projects of Community interest.

CREST already has a number of important achievements to its credit, notably in the imple-

mentation of projects of Community interest (scientific and technical information, new sources of energy) and in its planning of cooperation with non-Community countries (particularly in the field of scientific and technical cooperation (COST)).

It must be recorded, however, that, as far as the coordination of national policies and the rational selection of common objectives is concerned, no significant results have been obtained to date. Nevertheless, two pilot experiments for discussing plans and programmes have been initiated in the fields of energy and medical research and in 1976 should bear fruit in the form of proposals for the alignment of national policies in these two sectors. This is very much a first attempt, however, and the difficulties encountered in gathering information suggest that progress towards the coordination of national activities will be fairly slow.

Two other pilot experiments are currently in hand, one concerning the comparison of budgetary forecasts and the other concerning determination of R & D indicators, which should lead to a better understanding of trends in and assessments of research policy in the member countries. These are no more than new methods of coordination which, together with existing instruments such as the Advisory Committees on Programme Management (ACPM), should in the coming years enable CREST to achieve optimum fulfilment of its highly complex task of coordination.

The Commission recognizes the fundamental importance that should be given to this coordination activity for the development of a common R & D policy; the Commission considers that as this coordination calls for precise and substantial proposals an attempt at synthesis would be premature taking into account the current progress of this work. The Council of the European Communities believes that, by the end of 1976, the conclusions should be drawn from the initial experiments for the purposes of assessing the effectiveness of the procedures tried out, elaborat-

¹ Item 7 of the Declaration, Bull. EC 10-1972, part I, Chap. I.

² OJ C 7 of 27.1.1974; Bull. EC 1-1974, points 1401 to 1406.

ing the appropriate mechanisms and determining the guidelines for a common policy.¹

However, to meet the wishes expressed by the Council at its meeting of 26 June 1975,² an initial discussion should be held without delay on the objectives which could be adopted for the common policy on science and technology.

The main aim of this document, therefore, is to serve as a basis for discussion in the Council on the guidelines to be followed and the major objectives which should be adopted in the common policy up to 1980. In accordance with the resolution of 14 January 1974,¹ the Commission will submit to Council by the end of 1976 a report on the conclusions to be drawn from the initial experiments carried out during this experimental three-year period as foreseen in this resolution.

Medium-term objectives and priorities for the Community

Objectives

In the light of the discussions which have been going on for some years in the Community on the Community functions and objectives of research and development and according to the initial conclusions which have emerged since 14 January 1974, it is now possible to put forward two lines of approach to guide the choice of projects to be undertaken in the medium term, i.e., from now until 1980.

Community research activities should be worked out:

- (a) either in terms of the sectoral policies adopted by the Community in such a way as to promote the fulfilment of the objectives laid down for these policies (e.g., agriculture, energy),
- (b) or with the aim of helping to map out new policies which the Community would like to debate and which might possibly be adopted (e.g., raw materials, town planning...).

In keeping with this line of approach, and on the basis of the expressed needs of the sectors of Community activity, the Commission considers that from the point of view of interest to the Community, the following research sectors and sub-sectors appear to be of priority importance over the next five years:

Resources: energy, agriculture, raw materials

*Energy*¹

- (i) Energy economy
- (ii) Production and use of hydrogen
- (iii) Solar energy
- (iv) Geothermal energy
- (v) Systems analysis: construction of models

¹ Council Resolution of 14.1.1974 on the coordination of national policies and the definition of projects of interest to the Community in the field of science and technology, OJ C 7 of 29.1.1974; Bull. EC 1-1974, point 1402.

² Bull. EC 6-1975, point 2263.

¹ Council Resolution of 17.12.1974 on the objectives for a Community energy policy for 1985, Bull. EC 12-1974, point 1202, and Council decisions of 22.8.1975 adopting an energy research and development programme, OJ L 231 of 2.9.1975.

- (vi) Thermonuclear fusion
- (vii) Radiation protection
- (viii) Reactor safety
- (ix) Nuclear energy (with particular reference to waste processing, supervision of fissile materials, use of Pu)
- (x) Coalmining research
- (xi) Hydrocarbons

Several research programmes relating to these sub-sectors with the effect of extending or developing on-going projects have already been the subject of recent Council Decisions¹; others are planned within the framework of the new JRC multiannual programme.

*Agriculture*²

- (i) Animal leucosis
- (ii) Effluent from stockfarming
- (iii) Production of beef and veal
- (iv) Production of vegetable protein

An initial series of projects has already been decided by the Council in these areas.¹

Raw materials

- (i) Inventory of Community resources (exploitation)³
- (ii) Raw materials recycling (substitution)
- (iii) Remote sensing⁴

Environment⁵

- (i) Research to find criteria for pollutants and potentially toxic chemicals.
- (ii) Research and development concerning the management of information on the environment, with particular reference to chemicals likely to contaminate the environment.
- (iii) Research and development on the reduction and prevention of pollution and nuisances, in-

cluding R & D on the application of 'clean' technologies.

- (iv) Research and development on the protection and improvement of the natural environment.

A proposal for the indirect action programme (1976-80) which extends or develops on-going actions, was recently forwarded to the Council.¹

Economic and industrial development

Advanced industries : Data processing,⁶ aeronautical sector,⁷

Traditional industries: Iron and steel, textiles, others (footwear, ceramics).

Research and the life of society

- (i) Social research
- (ii) Biomedical research
- (iii) Urban development; construction
- (iv) Transport and telecommunication systems

As regards this last set of topics, although some biomedical research (ECSC programmes) has already been the subject of Council Decisions, al-

¹ cf. Annex I.

² Council Regulation (EEC) No 1728/74 of 27.6.1974 on the coordination of agricultural research, OJ L 182 of 5.7.1974; Council Decision of 22.7.1975 adopting common research programmes and programmes for the coordination of research in the field of animal leucosis, livestock effluents, beef production and plant protein production, OJ L 199 of 30.7.1975.

³ Council Decision of 25.8.1975 amending Decision No 73/176/EEC adopting a programme of research in new technologies (use of solar energy and recycling of raw materials), OJ L 231 of 2.9.1975.

⁴ Council Decision of 25.8.1975 amending Decision No 73/127/EEC adopting a research programme for the European Economic Community the field of teledetection of earth resources, OJ L 231 of 2.9.1975.

⁵ Declaration of the Council and of the representatives of the Governments of the Member States meeting in the Council of 22.11.1973 on the programme of action of the European Communities on the environment, OJ C 112 of 20.12.1973.

⁶ Council Resolution of 15.7.1974 on a Community policy on data processing, OJ C 86 of 20.7.1974.

⁷ Communication and proposals from the Commission of 1.10.1975 on an action programme for the European aeronautical sector, Supplement 11/75 — Bull. EC.

though a new indirect action programme on 'Biology' has been drawn up, and although the social action programme adopted by the Council on 21 January 1974¹ has extended the scope of investigation by the Community authorities, it is envisaged that this type of activity be substantially developed over the next five years.

Besides the activities to be selected and developed in order to satisfy requirements in these priority areas, there will be two continuing functions to be carried out by the Community:

- (a) one of a public service character (for example, Community Bureau of References (CBR)),
- (b) a general 'information management' function.

Whether information and scientific and technical documentation were involved, or optimum utilization of and transfer of knowledge on a more general level, the Community would have an increasing role to play, to which could gradually be added education and training functions; the exercise of these functions would without doubt be more to the benefit of the developing countries than to that of the Member States.

External relations

The importance that must be attached in the next few years to the Community's external relations is such that all the joint or concerted programmes to be drawn up to meet requirements in these priority fields ought to take into account the opportunities for and desirability of participation by European countries, members of COST, and other developed non-member countries.

It will likewise be especially important to consider systematically the possibilities for cooperation with developing countries.

Criteria for the choice of projects of Community interest

The Commission has already sought to focus its recent programme proposals on the four priority areas set out above and intends to systematize its

efforts in this direction provided the Council approves its choices (as regards both indirect action and the Joint Research Centre — JRC programme).

As to the choice of the actual projects within the proposed areas, this has since 14 January 1974² been governed, and would be for the five years ahead, by the following criteria;³

- (i) action designed to contribute directly to implementation of the Community's sectoral policies (e.g., agriculture, energy),
- (ii) action which, because of the extent of the human and financial resources required, cannot be carried out on a national basis (e.g., Fusion programme),
- (iii) action where development costs and outlets call for a huge market (e.g., aeronautical sector, data processing),
- (iv) action that is transnational by its very nature (e.g., transport and telecommunications system, scientific and technical information and documentation),
- (v) action meeting local-authority requirements common to the Member States (e.g., environment, town planning, biomedical research, CBR).

Implementing procedures

For the purposes of the priorities adopted, the procedures for implementing Community activities will have to be defined *case by case*, according to the nature and characteristics of each activity. The Commission will in this connection have to specify, in consultation with CREST, the options to be taken up: direct action, indirect action, concerted action, coordination of national programmes, or any appropriate combination involving these various methods.

¹ Supplement 2/74 — Bull. EC.

² Council Resolution on the coordination of national policies and the definition of projects of interest to the Community in the field of science and technology, OJ C 7 of 29.1.1974, Bull. EC 1-1974, point 1402.

³ These criteria had already been defined by the Commission in its communication of 14.6.1972 entitled 'Objectives and methods for a common policy on scientific and technical research', Supplement 5/72 — Bull. EC.

Table 1 – *Research and development appropriations entered or anticipated, by financing categories (1975, 1976-1980)*

(R): activities adopted by the Council (current prices).
(P): activities proposed or adopted by the Commission (current prices except where otherwise indicated).
(A): activities in preparation in the Departments (constant prices except where otherwise indicated).¹

(estimates in 1 000s of u.a.)

Financing categories	1975	1976	1977	1978	1979	1980
I. <i>JCR direct action</i>						
(R)	59 171	70 587				
(A)			89 000	(94 000)	(100 500)	(106 500)
II. <i>Indirect action</i>						
R & D contracts, contracts of association and concerted projects						
(R)	38 021	24 283	30 248	27 739	13 919	1 703
(P)		61 153 ¹	82 001 ¹	84 735 ¹	82 486 ¹	83 449 ¹
(A)		3 675	7 915	(15 025)	(30 000)	(45 750)
Total II	38 021	89 111	120 164	127 499 ²	126 405 ²	130 902 ²
Total I+II ³	97 192	159 698	209 164	221 499 ²	226 905 ²	237 402 ²

¹ Including the 'Fusion' Programme JET project; evaluated as from 1977 at 1975 prices (108 Muc).

² Total including constant-price evaluation.

³ To this total should be added ECSC actions whose figures are not included above.

NB. For the years 1976 and 1977, all activities (R), (P) and (A) are expressed at current prices. For the period 1978-80, this is also true for activities decided by the Council and the Commission (R) and (P); whereas, activities in preparation (A) are expressed at constant prices (1.1.77 for direct activities, 1975 for indirect activities) and the corresponding figures are put in brackets.

In order to ensure cohesion of direct, indirect or concerted action taken in one and the same field of activity, the setting-up of Advisory Committees on Programme Management (ACPM) will have to be systematically planned.

Financial estimates for 1976-80

In order to provide maximum information for the Council's discussion, a table of financial estimates for the years 1976 to 1980 is presented. This covers:

- (a) the annual and multiannual programmes adopted by the Council;
- (b) programme proposals at present before the Council;¹

(c) estimates relating to the next JRC multiannual programme;

(d) estimates relating to programmes either being studied or being prepared which will be presented to the Council before 1980.

Owing to the numerous difficulties inherent in any attempt at medium-term forecasting—difficulties increased by the present economic instability and uncertainty—this table cannot be considered as absolutely exhaustive. As an approximation, however, it has been sufficiently researched and checked to serve as a valid working basis.

The Commission reserves itself the possibility of modifying these estimates as is necessary according to the needs which may become apparent during this period.

¹ Bull. EC 7/8-1975, points 1501 to 1505.

Basic principles for the implementation of projects of interest to the Community

In the implementation of research projects, the Community will be guided by the following principles:

Sharing of tasks

Whenever a project is to be implemented by way of indirect or concerted action, care must be taken to share out the tasks with due regard to the strong points of each Member State.

In this connection, it should be stressed that the promotion of research can be used to further a policy of industrial conversion and diversification; this means that regional considerations will have to be taken into account in the selection of sites for the implementation of R & D programmes.

It should further be borne in mind that this common research and development policy would also have to facilitate closer collaboration between researchers with a view to the establishment of a European scientific and technological community.

Link between the research and development phase and the utilization phase

The definition and implementation of a common research and development policy might well run into trouble in various industrial sectors unless it covers the whole of the innovation process, from the laboratory, through industrial application, to the marketing of the products resulting from the research. In the Member States, research and development policy and industrial policy are closely interrelated; even the award of research contracts is often governed by structural considerations (concentration on a small number of sufficiently large undertakings or, alternatively, systematic promotion of small- and medium-sized industries). Further, the active support provided by public authorities does not stop at the research phase, but extends to the process of transforming

the results of research into new products or processes, and the launching of those products and processes on the market. There would not have to be any difference in procedure if the effort in this field had to be made at Community level instead.

Obviously, the task of adopting the measures required for this purpose comes within the field of industrial policy. It may prove essential, however, to establish a close link between the successive phases of action. This is especially true of the major advanced-technology programmes such as the one proposed by the Commission for the aircraft industry¹ for which it is essential to define a common industrial strategy before one can even begin tackling research and development projects.

Dissemination and utilization of research results

The effort employed in disseminating and utilizing the results of the research should be commensurate with the effort devoted to the research itself.

When committing itself to a programme, the Community will have to anticipate the conditions under which the expected results can best be disseminated and utilized; this will affect the manner in which the research is implemented. On completion of the programme, the results will be classified and evaluated and, where necessary, decisions will be taken on schemes for industrial application and optimum utilization.

There are various cases to be considered, namely:

— *Research for social purposes* (bio-medical sciences, environment, town planning, education, etc.) generally calls only for techniques for disseminating the information acquired. Here it will be necessary to step up the efficiency and speed of the dissemination media European STID (scientific and technical information and documentation) network, micro-reproduction, condensed reports, selective circulation, etc.). The results of this research will have to be communicated in a suitable form to the decision-makers so

¹ Supplement 11/75 — Bull. EC.

that they can be taken into account in the drawing-up of common policies.

— In the case of *medium-term research for industrial purposes*, which is carried out under contract by industrial firms, there does not seem to be any reason why the policy the Community has followed up to now should be greatly altered. The firm that carries out the research will remain the owner of the new products, equipment and processes that it has invented, and will be given priority in exploiting them.

If, however, there were several complementary research projects converging towards cognate results, agreements would have to be concluded between the companies concerned on the sharing of research tasks and cooperation in industrial exploitation. Such agreements would at least provide for the exchange of information and licences.

In return for the priority of exploitation accorded to them, the companies will have to undertake to utilize the results in ways that will meet the requirements of the Community. The Commission will exercise stricter control over this obligation, and will have the right to grant licences to third parties if it is not complied with.

Finally, there will be certain fields in which the author of the research or his licensees will be required to pay royalties to the Community in consideration of its contribution.

If research of this kind is entrusted to the JRC, any industrial undertaking in the Community will be able to obtain a licence. The same will apply if the research is carried out under contract by research institutes which do not have the capacity to utilize them.

— Among the *long-term projects for industrial purposes*, one example that might be taken is that of controlled thermonuclear fusion.

Although the construction of fusion reactors is only a distant prospect, the necessary conditions for the 'Fusion' project, if it succeeds, to result in joint industrial application should be created progressively.

If the JET is constructed, industry will be closely associated with the project. The undertakings which participate in the construction process will

be those best placed to carry out the subsequent phases of the programme. In the choice of these undertakings and of their suppliers, particular attention will be accorded to this factor.

It will also be advisable to guard in advance against the risk of Community cooperation collapsing when the prospects of industrial exploitation begin to take shape. Certainly, the Community cannot undertake to support the project right up to the completion stage, but it would not be acceptable to leave any loophole through which the project could be taken over by means of *national financing*, serving to protect the industries of certain Member States, without the agreement of, and conditions laid down by, the Community. In this respect, very clear political involvement will be necessary at each stage of development.

These guidelines can be applied to other large-scale projects but, in certain fields, the restructuring of an industrial sector, the grouping of public orders and measures for standardization can be relied upon more than direct financing of the research to trigger off the process of innovation.

With regard to securing optimum utilization of the research results, the Community will have to set up a mechanism for verifying, listing and evaluating the results of Community research.

Sufficient resources for demonstration, testing and prototype construction will enable the Community to make more attractive for their potential users the results of research projects assigned to the JRC or to research institutes, or those results which the industrial contractors have not been able to utilize.

These operations should be carried out in collaboration with national institutions, either public or private, specializing in obtaining the maximum benefit from research results.

Furthermore, the Commission considers that the coordination of national policies in the field of science and technology involves comparison of national policies for the optimum utilization of research results, in the spirit of the Council resolution of 14 January 1974.¹

¹ OJ C 7 of 29.1.1974, Bull. EC I-1974, point 1402.

Role of the JRC

Created in 1958 on the basis of the Treaty establishing the European Atomic Energy Community (Euratom), the Joint Research Centre (JRC) was intended to supplement the nuclear research of the Member States by carrying out the Community research and training programme. However, it became apparent as early as 1962 that owing to the position of the Member States *vis-à-vis* the JRC the latter would be called upon to carry out programmes which would be difficult to fit into a coherent energy or industrial policy, as they should have.

This situation has resulted in the institutional authority and the powers of Euratom being called into question, in a restrictive interpretation of the Treaty and in the crisis of 1968-72, for which the solution that could be found in 1973 was no more than the extension of the JRC activities to non-nuclear spheres.

Bearing in mind the economic conditions and, in particular, the advanced state of development of the nuclear industry, it appears justifiable that the JRC does not limit its activities solely to the nuclear field. From now on, its new activities will have to dovetail with the common science and technology policy. In this context, the JRC would have a quadruple role to play, i.e.:

- (a) to serve as a focal point, point of crystallization, or as a catalyst to projects coordinated at Community level through its own research activity and in close association with corresponding indirect action programmes;
- (b) to carry out by means of direct action research activities of a central nature, highlighted by the setting up of large installations or experiments;
- (c) to also carry out research or a certain amount of independent assessment where the absence of participation in industrial development puts important economic interests at stake;
- (d) finally, to support Community sectoral policies by retaining its own research expertise within the Commission and according to the need to use its expertise and help in the formulation of new policies.

Within the limitations of this role, and bearing in mind both the options proposed in this document and the 'disciplinary' make-up of the JRC, the Centre should direct its activities towards the energy and environment sectors.

This task can only be undertaken if the Centre's structures and organization are modified such as to:

- integrate its activities within the whole range of Community activities carried out in any one sector as part of a specific programme. In this respect, it would be advisable to review the role of the Advisory Committees on Programme Management (ACPM);
- ensure the continuity of the projects by adopting timescaled 'rolling programmes';
- improve its effectiveness by giving it the necessary flexibility in the management of its projects (staff mobility, margin of manoeuvre in the use of staff or appropriations).

It is with this in view that the next proposals for the JRC's multiannual research programme should be drawn up and presented to the Council in 1976.

Long-term Community objectives and priorities

To be capable of defining and implementing the options as regards the long-term scientific and technological objectives for the Community—in line with its strengths and weaknesses—the Community itself would have a continuous function of primary importance to fulfil: that of forward analysis, of forecasting and of technological assessment.

In this context the following problems arise:

— How and with what methods would the Community fulfil such a function, keeping the way open for requests from the Member States, the regions and the professions, and also from the developing and developed countries outside the Community?

— With what types of instrument suitable for performing forward studies, constructing development models, carrying out systems analyses, etc., would it be advisable to provide the Community?

These are the questions which the Commission hopes to be able to answer during 1976. It will in particular base them on studies already under way ('Europe plus 30'¹ and 'Medium-term Community R & D plan', a study carried out on the initiative of CERD).

Initial proposals will be forwarded to the Council in the course of 1976.

Conclusions

The basic aim of this document has been to identify:

(a) the medium-term (1976-80) objectives and priorities which the Commission proposes for adoption at Community level;

(b) the basic principles for carrying out the relevant projects of Community interest;

(c) the order of magnitude of the financing that is to be anticipated for the fulfilment of the projects proposed or in the process of being worked out within this priority framework.

The Council is requested to give its opinion on the policies outlined in this communication from the Commission.

¹ Bull. EC 9-1975, point 2243.

Annex I

Annual and multiannual programmes approved by the Council (EEC and EAEC Treaties) approved by the Commission (ECSC Treaty) or presented by the Commission to the Council since 14 January 1974

Since the beginning of 1974 the following projects and programmes have been proposed by the Commission and approved by the Council:

under the EAEC Treaty

million u.a.

– plutonium recycling	4.5 (1975-78)
– management and storage of radioactive waste	19.16 (1975-79)

under the EEC Treaty

– 1975-77 three-year action programme on scientific and technical information and documentation	1.84 (1975)
– programme of technological research in the textile sector	0.25 (1975-78)
– multiannual R & D programme on new sources of energy (solar energy, hydrogen, geothermal energy, energy economy, construction of systems models)	59.00 (1975-78)
– multiannual programme on agricultural research	10.30 (1975-78)
– social studies and research	0.9 (1975)

The following research has been adopted by the Commission after a favourable opinion from the Council, in accordance with the ECSC Treaty:

million u.a.

– steel research	27.2 (1974-75)
– coal research	30.2 (1974-75)
– medico-social research	11.4 (1974-75)

The following proposals have been adopted by the Commission and presented to the Council:

(a) *under the EAEC Treaty*

million u.a.

– multiannual fusion programme 1976-80	265
– multiannual biology programme 1976-80	
radiation protection:	47.60
adaptation to agricultural research:	18.72

(b) *under the EEC Treaty*

– multiannual environment programme 1976-80	18.50
– multiannual Community Bureau of References programme 1976-79	3.90

Annex II

Table of financial estimates 1976-1980

Introductory note

The attached table has been prepared on the basis of a survey of the research and development programmes and groups of projects anticipated by the services of the Commission during the next five years.

The data relates to information available on 15 September 1975, that is to say, before the first budgetary debates of the Council; thus they do not prejudice the final decisions which will be taken in this area at the end of the current year.

The programmes are subdivided by sectoral policies and distinguish between direct-action projects of the Joint Research Centre and other action. Furthermore, all the projects are listed according to their state of advancement in the decision making procedures: (R) Council resolutions or decisions; (P) Commission proposals or decisions; (A) projects being prepared in the competent departments of the Commission.

In most cases programmes are not concerned solely with research and development activities; this is so for direct actions and most research contracts and consortia. However, in some cases (technological development assistance, informatics programmes, STID programmes, etc.) the actions also include other activities; thus an effort had to be made to estimate the research portion which is what appears in the table, with a note to this effect.

The projects decided by the Council and the Commission (R) and (P) are expressed in current prices for the whole period. Projects in the preparatory stage (A) planned for 1976 and 1977 are treated in the same way. The (A) projects are however estimated at constant prices for the period from 1978-80 (1 January 1977 prices for the direct action projects of the JRC and 1975 prices for the other action).

Table 2 — *Research and development appropriations included or expected by programme or group of projects*

Estimates in 1 000 u.a. for the expenditure relating to :

(R) Council decisions (current prices)

(P) Proposals or decisions of the Commission (current prices)

(A) Projects being prepared in the competent departments of the Commission (current prices for the years 1976 and 1977; constant prices for the period 1978-80)

R & D programmes or groups of projects	1975	1976	1977	1978	1979	1980
AGRICULTURAL POLICY						
<i>Direct action JCR</i>						
<i>Indirect action</i>						
Research on swine fever (R)	455	713				
Common and concerted programmes on agronomic research (R) (A)	645	3 239	3 526	2 890	(3 000)	(3 500)
Biology-application of nuclear techniques to agronomic research (R) (P)	1 329	230 2 270	3 280	3 990	4 280	4 530
ENERGY POLICY						
<i>Direct action JCR</i>						
Classical nuclear energy (R) (A)	19 178	23 383	36 200	(36 200)	(37 200)	(37 200)
Applications of nuclear energy for purposes other than the generation of electricity (R) (A)	3 397	4 762	6 700	(6 700)	(7 200)	(7 200)
New sources of energy (R) (A)	971	1 238	10 600	(15 600)	(20 600)	(26 600)
<i>Indirect action</i>						
Recycling of plutonium (R)	499	1 024	1 041	960	976	
Management and storage of radioactive waste (R)	1 315	3 832	4 849	4 269	3 192	1 703
Energy economy (R) (A)	99	2 139	3 660	3 660	1 822 (1 500)	(3 000)
Production and use of hydrogen (R) (A)	110	2 084	4 420	4 420	2 206 (2 500)	(5 000)
Solar energy (R) (A)	149	2 379	6 000	6 000	2 972 (2 000)	(4 000)
Geothermal energy (R) (A)	91	2 307	4 240	4 240	2 122 (1 750)	(3 500)

Table 2 (continued)

R & D programmes or groups of projects	1975	1976	1977	1978	1979	1980
Systems modelling (R) (A)	51	600	1 300	1 300	629 (600)	(1 200)
Technological development in the hydrocarbons sector ⁽¹⁾ ⁽⁶⁾ (R) (P) (A)	34 000	27 000	40 000	40 000 ⁽²⁾	40 000 ⁽²⁾	40 000 ⁽²⁾
Dragon Agreement (R) (P)	3 114	471 7 000	7 580	7 760	7 840	8 150
Thermonuclear fusion ⁽³⁾ (R) (P)	21 380	1 824 38 871	56 530	56 350	56 530	56 530
Biology and health protection (R) (P)	3 935	481 6 800	8 400	9 800	10 600	11 400
Research on uranium prospecting ⁽⁴⁾ ⁽⁶⁾ (P) (A)		750	1 500 ⁽⁵⁾	3 000 ⁽⁵⁾	3 000 ⁽⁵⁾	3 000 ⁽⁵⁾
Rational use of energy for road transport (A)		1 050	1 350	(6 000)	(8 000)	(14 000)
Other projects (fuel batteries, other sources of energy, etc.) (A)			1 000	(2 000)	(3 000)	(3 000)
Coordination projects (fastbreeder reactors, safety of nuclear installations) (A)		450	520	(400)	(400)	(400)
INDUSTRIAL POLICY						
<i>Direct actions JRC</i>						
<i>Indirect actions</i>						
Textile industry research (R)	70	90	90			
Informatics						
— Industrial development programmes (P) First part ⁽⁷⁾ (P) Second part ⁽⁷⁾		1 000	160			
— Research on data processing (A)			token entry	token entry	token entry	
Research on other traditional industries (footwear, non-ferrous metals, ceramics, etc.) (A)			272	(725)	(700)	(700)
Other programmes (aeronautics, electronics, innovation and industrial development contracts) (A)			token entry	token entry	token entry	token entry

Table 2 (continued)

R & D programmes or groups of projets	1975	1976	1977	1978	1979	1980
SOCIAL POLICY						
<i>Direct action</i>						
<i>Indirect action</i>						
Vocational training, employment, fight against poverty, living and working conditions, other action ⁽⁸⁾	150	250	400	600	800	1 050
(R)						
(P)						
Research by the Medical Research Committee			token entry	token entry	token entry	token entry
(A)						
Town-planning research		250	500	(600)	(700)	(700)
(P)						
(A)						
Various research in the social sciences			200	(200)	(300)	(500)
(A)						
ENVIRONMENT POLICY						
<i>Direct actions JRC</i>						
Environmental projects	4 742	5 701	9 800	(9 800)	(9 600)	(9 800)
(R)						
(A)						
<i>Indirect action</i>						
Protection and improvement of the environment	2 880	1 455 4 237	4 651	4 930	1 916	1 789
(R)						
(P)						
DEVELOPMENT AID POLICY						
<i>Direct action JCR</i>						
<i>Indirect action</i>						
Grants from the technological section of the EDF ⁽⁶⁾		7 000	11 000	15 000	18 000	19 000
(P)						
Programme 'mil' (EDF)	360	350	370	390	390	
(R)						
(P)						
Other action (outside EDF)			150	(300)	(500)	(1 000)
(A)						
RESOURCES AND RAW MATERIALS						
<i>A. Direct action JRC</i>						
Remote detection, management and recycling of raw materials	1 129	1 400	2 400	(2 400)	(2 400)	(2 400)
(R)						
(A)						
<i>B. Indirect action</i>						
(A)			300	(500)	(600)	(700)

Table 2 (continued)

R & D programmes or groups of projects	1975	1976	1977	1978	1979	1980
PUBLIC SERVICE AND OTHER ACTIONS						
<i>Direct action JRC</i>						
Measurements, standards and reference methods						
(R)	8 984	10 527				
(A)			11 700	(11 700)	(11 700)	(11 700)
Service activities (data processing, systems studies, etc.)						
(R)	11 631	13 502				
(A)			11 600	(11 600)	(11 600)	(11 600)
Other activities						
(R)	9 139	10 085				
(A)						
<i>Indirect action</i>						
STID action plan ⁽⁹⁾						
(R)	184	215	250			
(A)				(700)	(750)	(750)
Community Bureau of References ⁽¹⁰⁾						
(R)	666	500				
(P)		475	1 000	1 125	520	
Education and training ⁽¹¹⁾						
(R)	899	700	872			
(A)			373	(900)	(1 000)	(1 100)
Research programmes in the transport sector (improvement of traffic, better use of data processing)						
(A)		2 175	3 250	(2 700)	(2 700)	(2 700)

(¹) R & D element only (estimated at 67% in 1975 and 1976, and 80% in 1977-1980).

(²) Estimates at face value (total expenditure).

(³) For the period 1976-1980, the JET project has been estimated at 1975 prices (108 M u.a.).

(⁴) R & D element only (estimated at 15% for the period in question).

(⁵) Estimates at nominal value (total expenditure).

(⁶) Because of the specific character of their finance (subsidies, development grants, extra-budgetary finance) these projects have not been taken into account in the table on p. 9 of this document.

(⁷) R & D element only (estimated at 25% for the first part and considered negligible in second).

(⁸) R & D element only (estimated at less than 5% of all the actions in question).

(⁹) R & D element only (estimated at 10% for the first plan and at 25% for the second).

(¹⁰) R & D element only (estimated at 80% for the period in question).

(¹¹) R & D element only (estimated at about 70% for the period in question).

NB. Data expressed at constant prices are in brackets. To the total should be added ECSC actions whose figures are not included hereunder.