

# Science, research and the European Community

## European File

Times are difficult in Europe and every country is confronted by a number of economic and social problems which will have to be overcome if we are to maintain our standard of living and our place in the world. Research can play a vital role in helping us meet the challenge ahead.

- Staying competitive:* more than the United States and the USSR, European countries depend on external suppliers for raw materials and, above all, energy. To secure these supplies we must be able to offer in exchange goods that are both price- and performance-competitive. This implies continuous research and technological innovation to underpin existing industries and pave the way for new ones. In the long run, we need research to develop substitute materials and improve resource-use by reducing waste, designing more durable goods, improving recycling techniques, etc.
- Safeguarding the quality of life:* research cannot simply be geared to economic survival; it must also improve the quality of life which is a growing cause for concern amongst Europeans. To solve many of the problems confronting society — pollution, living and working conditions, etc. — Europe's brainpower is already being mobilized.

### Why Community-level research

Community-level research can help us solve the many problems we face because:

- some research and development (R&D) fields require by their very nature transnational action (transport, telecommunications, etc.) whilst others such as data-processing and aerospace are natural candidates for joint R&D due to the nature of their markets;
- many research projects are beyond the financial and human means of an individual country and there is a common need to spread the costs and risks. Joint action can enable countries to conduct projects which would normally have been beyond their scope, e.g. development of new energy sources such as controlled thermonuclear fusion;
- national governments' political objectives are often of a medium or short-term character, whereas the structural problems facing Community projects and actions offer an opportunity for a long-term approach — especially in important fields like raw materials supply;
- in areas such as environment, town planning, etc, the Nine face common research needs which justify greater cooperation;
- cooperation at the Community level can ensure optimal use of scarce resources such as manpower, money and materials, and prevent the duplication of effort whilst ensuring that no important research sectors are overlooked;
- Community R&D can be used to underpin the Community's own sectoral policies (e.g. environmental protection, energy and agriculture) and at the same time help to develop new policies of vital interest to Europe's future: raw materials supply, improvement of living and working conditions, advanced technology;
- last but not least, Community science and technology policy can have an important 'catalytic' effect, not only by bringing together scientists and research teams and improving the dissemination of information and research results inside the Community, but also by initiating specific projects at the vital 'demonstration' phase of the R&D process, the all important link between research and production.

### **Towards a common policy for science and technology**

The Treaties setting up the European Communities made only sectoral provision for common R&D activities. Nevertheless, a solid basis for Community action was created for the future:

- the European Coal and Steel Community (ECSC), set up in 1951 has carried out much valuable work in such diverse fields as mine safety, mining technologies, pollution control of steelworks, product quality, new technologies and ergonomics;
- the European Atomic Energy Community (Euratom), founded in 1957, led to the creation of the Joint Research Centre (JRC) which employs about 2 300

people at Ispra in Italy, Geel in Belgium, Petten in the Netherlands and Karlsruhe in Germany. An instrument of a purely Community nuclear energy research policy, the JRC encountered various difficulties in the 1960s. It worked on an original nuclear fission reactor design which was ultimately abandoned. Lacking national agreement on a European industrial policy, Community countries preferred to rely on their own or American designs. Today, with less ambitious objectives, the JRC continues its work which has been extended to cover environmental problems;

- the European Economic Community (EEC), founded the same year as Euratom, made provision for a coordinated research in only one sector: agriculture.

At the Paris Summit meeting in 1972, Community Heads of State and Government called for the development of a common policy in the field of science and technology based on 'the coordination of national policies' and 'joint implementation of projects of interest to the Community'. In January 1974, the Nine adopted a resolution which specified the objectives for this common policy: eliminating the duplication of effort; reducing the cost of national and Community projects and raising their effectiveness; avoiding divergences in national research orientations; gradually harmonizing procedures for formulating and implementing scientific policies within the Community.

To accomplish this the Nine agreed to examine and compare their research programmes and objectives. They set up the scientific and technical research committee, CREST, composed of senior national officials, with the task of coordinating national R&D policies and advising Community ministers as well as the European Commission. A European research and development committee, CERD, composed of independent scientific experts, also advises the Commission. Links have also been established with the European Science Foundation — a new research organization oriented towards basic research.

The 1974 resolution also paved the way for a new approach to Community research: 'concerted action' which is carried out and financed by Member States with the European Commission responsible for coordination. Other Community research actions can be either direct (carried out by the Joint Research Centre) or indirect (carried out in national laboratories and research centres but coordinated and part-financed by the Community).

On this basis, several joint research programmes were launched between 1974 and 1977, particularly in the fields of energy and environment.

### **The way ahead**

In June 1977, the European Commission suggested new guidelines to the Nine's Council of Ministers for a common policy in the field of science and technology. It stressed the central role of science and technology in the development of European policies and identified the main objectives: ensuring long-term supply of re-

*Community credits for R & D (in 1 000 EUA <sup>1</sup>  
current prices and exchange rates)*

Sectors	1973	1976	1977	1978 <sup>2</sup>
1. <i>Resources</i>	45 082	102 353	153 972	183 656
Fossil energy	2 160	24 987	38 758	37 500
Nuclear energy	38 785	62 000	83 725	105 152
New energy sources	1 885	9 290	22 173	28 109
Energy conservation	—	520	3 095	4 123
Agriculture	1 534	4 074	3 526	2 890
Raw materials	78	62	5	2 800
Other resources	640	1 420	2 690	3 082
2. <i>Industrial development</i>	14 160	25 135	24 891	35 927
Advanced technologies industries	—	42	99	9 913
Other industries	7 676	12 098	14 670	14 891
Services and infrastructure	6 484	12 995	10 122	11 123
3. <i>Life in society</i>	6 483	9 749	15 137	17 191
4. <i>Environment</i>	3 416	7 521	11 841	13 200
5. <i>Dissemination of information, formation, forecasting</i>	1 295	2 290	3 557	4 971
<b>Total</b>	<b>70 436</b>	<b>147 048</b>	<b>209 398</b>	<b>254 945 <sup>3</sup></b>

<sup>1</sup> 1 EUA (European unit of account) = approx. £0.63 or £IRL 0.67 (at rates current on 15 June 1979).

<sup>2</sup> Provisional figures.

<sup>3</sup> Of which: direct actions at the JRC 34.6%, indirect or concerted actions 42.0%, steel and coal research 13.9% hydrocarbons 9.4%.

sources (raw materials, energy, food and water); promoting international competitive economic development; improving the environment and living and working conditions.

**(a) Long-term supply of resources**

The earth's resources are finite and Europe, poorly endowed with raw materials, could face grave shortages in the not-too-distant future. The Community has a duty to itself, to the developing world and to future generations, to ensure that scarce resources are not squandered.

- Energy*: the Community's dependence on external suppliers (especially of oil) must be reduced by developing indigenous and renewable energy resources.

- **Fossil fuels:** in addition to research carried out through the European Coal and Steel Community, the Commission has proposed financing demonstration projects to improve the use of our coal resources. The Community also funds technological projects in the hydrocarbons field (exploitation of offshore deposits, etc.)
  - **Energy conservation:** it is just as important to save energy as it is to develop new sources. The Community funds research and finances demonstration projects.
  - **Nuclear power:** a large share (22%) of the current four-year JRC programme adopted in July 1977 is devoted to research into reactor safety. In the aftermath of the Harrisburg accident, this fact should perhaps be underlined. Research is also being conducted into radiation protection and the management of radioactive waste. In March 1977, the Nine approved new research programmes dealing with the safety of thermal water reactors and the decommissioning of nuclear power stations.
  - **Controlled thermonuclear fusion:** this new technique could provide us with a 'clean' and abundant source of energy. Construction of the experimental machine the JET (Joint European Torus) has begun at Culham (near Oxford). The five-year programme is currently being extended.
  - **Other energy sources:** in the aftermath of the first oil crisis, a new programme of indirect actions was adopted in 1975 to look at new sources of energy, in particular solar and geothermal energy. This involved the construction of a 1 MW experimental power station near to Catane, Sicily. For its part, the Joint Research Centre is undertaking various studies on photovoltaic cells and hydrogen for energy storage. Allocations to this sector should double over the coming years.
- **Raw materials:** the Community imports 70-100% of most of its raw materials and shortages of these in the coming years could pose major economic and political problems. A raw materials supply policy is now being developed, the major elements of which are the increase of internal supply and conservation. Research can make an important contribution through, for example, new methods of ore processing, intensifying prospection, improving mining technology, etc. 1978 saw the adoption of three important indirect action programmes in this sector: a four-year programme on primary raw materials; a three-year programme on uranium prospection and production, and a three-year programme on paper and board recycling. Further proposals deal with the recovery and recycling of secondary raw materials from municipal, industrial and agricultural wastes.
  - **Food resources:** in a world where millions do not have enough to eat, it makes sense to promote research which could not only help to improve Europe's productivity but also lead to developments applicable in the Third World. At present research on animal leucoses, swine fever, the use of effluents as a fertilizer, beef and veal production and plant protein production are being carried out.

## (b) **Staying competitive**

Europe cannot allow itself to be left behind by its principal competitors. The European Commission has consequently been pushing for the implementation of a common industrial policy and, with it, industrial research, coordinated at the European level, as a main element. Proposals have been put forward covering two sectors of vital interest:

- *aerospace*: a Community programme was proposed in 1977 to offer the European aircraft industry the possibility of joint development work within the framework of a long-term R&D strategy;
- *data-processing*: several joint-application projects in this field are now underway with Community finance. But more needs to be done and the European Commission has drawn up proposals for a four-year programme covering, among other things, standardization of materials, coordination of public procurement policies and support for software and peripherals.

A three-year programme on reference materials and methods adopted in February 1976 paved the way for the creation of a Community Reference Bureau to help improve the comparability of measurements and standards in research and industry. New proposals in this area have been introduced together with a draft programme on applied metrology.

## (c) **Quality of life**

Europe needs to survive as a viable economic entity but not at the expense of society or the quality of the environment — itself a vital resource that is in danger of being over-exploited.

- *Environment*: since 1973, the Community's environmental protection programme has been supported by research. A five-year programme was adopted in March 1976. Direct action conducted by the Joint Research Centre and indirect or 'concerted' actions in progress aim to improve understanding of pollution and its effects and to develop ways of both preventing and reducing it. Here again, new proposals have been put forward by the Commission.
- *Living in society*: various sociological research is being carried out concerning problems ranging from the urban explosion and its threat to the countryside, to the so-called diseases of civilization. A concerted programme to examine the growth of large urban concentrations has been under way since 1977. On the health front, the Community has embarked on research into radio-protection, congenital abnormalities, cellular ageing and extracorporeal oxygenation. On the work front, the Community supports research to improve working conditions, to reduce occupational hazards and to promote more humane conditions.

## Conclusions

- Many of the arguments favouring Community research (no duplication of effort, spreading costs, etc.) also favour even wider international cooperation. The Community already participates in numerous international programmes, particularly those conducted with neighbouring European countries in the framework of COST (Committee on European Cooperation in the field of Scientific and Technical Research). Close relations have been developed in the scientific field with organizations such as the International Energy Agency (IEA) and the Organization for Economic Cooperation and Development (OECD).
- Early and rapid access to scientific and technical information is an important requirement for science and industry. The Community is currently in the process of setting up a data transmission network (Euronet). Further investigations are being carried out into ways of disseminating R&D results and developing an industrial property policy covering the utilization of research results.
- We cannot allow the Community of tomorrow to be burdened by the effects of today's short-term decision-making. Future problems and opportunities are to be anticipated on the basis of probable scenarios of our future which can be devised, analysed, evaluated and retained or rejected as necessary. In order to evaluate long-term technological priorities and to ensure that new forms of R&D continue to evolve, serving the future needs of the Community, a programme of forecasting and assessment in the field of science and technology (FAST) was launched in July 1978 on the basis of the 'Europe + 30' feasibility study on the development of technological forecasting which was launched in 1974. The 1978 FAST programme operates in collaboration with specialized national bodies to monitor and analyse existing forecasting and research assessment activities, highlight potential conflicts, problems and opportunities facing the Community in the long term, and suggest alternative courses of R&D action to meet future needs.
- Forecasting is not enough however. Political will is also needed. Member States must also commit themselves further to coordinating research projects and programmes. They must set aside national self-interest in the evaluation of technological projects which are vital for Europe's industrial future. Community research policy, although endowed with limited funds (only 1.8% of public funds spent by Member States currently goes R&D, although this is an improvement compared with 0.8% in 1973) can often make the difference between success and failure and can have an important catalytic effect. Community countries can only benefit fully if they commit themselves to cooperating in this vital sector ■



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