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Report

Drawn up on behalf of the Committee on Energy and Research on the Common Research Policy : Problems and Prospects

Rapporteur: Mr R LINKOHR

OR:DE

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English Edition

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By letter of 15 October 1980 the Committee on Energy and Research requested authorization to draw up a report on the Common Research Policy: problems and prospects.

At its meeting of 30 October 1980 the enlarged Bureau authorized the committee to draw up a report on this matter.

The committee appointed Mr LINKOHR rapporteur on 25 November 1980.

On 18 September 1980 a motion for a resolution on the setting up of a special secretariat to sponsor Community energy research in Denmark was tabled by Mrs GROES and others pursuant to Rule 25 of the then Rules of Procedure (Doc. 1-406/80). On 19 September 1980 the European Parliament referred this motion for a resolution to the Committee on Energy and Research.

On 19 February 1981 the committee appointed Mr MORELAND rapporteur.

It considered the draft report at its meeting of 28 October 1981 and decided, on a proposal by the rapporteur, to continue its consideration of the motion for a resolution within the framework of its own-initiative report on the Common Research Policy: problems and prospects. Mr MORELAND was relieved of his duties as rapporteur.

On 11 March 1982 Mrs THEOBALD-PAOLI tabled a motion for a resolution pursuant to Rule 47 of the Rules of Procedure on setting up a European Federation of Institutes of Experimental Biology (Doc. 1-13/82). On 11 March 1982 the European Parliament referred to the motion for a resolution to the Committee on Energy and Research.

On 26 March 1982 the committee decided to consider the motion for a resolution within the framework of its own-initiative report on the Common Research Policy: problems and prospects.

At its meetings of 3 December 1981, 30 April 1982 and 24 June 1982, the Committee considered the draft report and on 24 September 1982 adopted the motion for a resolution and explanatory statement by 21 votes to 1.

The following took part in the vote: Mrs Walz, chairman; Mr Seligman, vice-chairman; Mr Linkohr, rapporteur; Mr Adam, Mr Bonaccini (deputizing for Mr Ippolito), Mr Galvez, (deputizing for Mr Pintat), Mr Fuchs, Mr Ghergo (deputizing for Mr Sassano), Mr Herman (deputizing for Mr Salzer), Mr Markopoulos, Mr Moreland, Mr Muller-Hermann, Mr Normanton, Mr Pedini, Mr Petersen, Mrs Pruvot (deputizing for Mr Galland), Mr Protopapadakis, Mr Purvis, Mr Rinsche, Sir Peter Vannech Mr Veronesi and Mrs Viehoff (deputizing for Mrs Lizin).

C O N T E N T S

A.

The Committee on Energy and Research hereby submits to the European Parliament the following motion for a resolution, together with explanatory statement:

MOTION FOR A RESOLUTION

on the Common Research Policy: problems and prospects

The European Parliament,

A. having regard to the motion for a resolution by Mrs GROES and others (Doc. 1-406/80),

B. having regard to the motion for a resolution by Mrs THEOBALD-PAOLI (Doc. 1-13/82),

C. having regard to the study by the Economic and Social Committee of the goals and priorities of a common research and development policy (CES 1033/81)

D. believing that the abilities of the Community's scientists and engineers should be harnessed more effectively for the acquisition of new technologies

E. having regard to the report of the Committee on Energy and Research (Doc.1-654/82),

1. Notes that Community research expenditure accounts for only about 1.5% of all public research expenditure in the European Community;

2. Notes further that only 1.8% of the Community budget is devoted to research expenditure;

3. Considers that the sharp increase in real terms in the cost of research creates considerable budgetary problems for the Member States and, to a lesser extent, for the Community too;

4. Recognizes the industrial and technological challenge by the USA and Japan as endangering the competitiveness of the European Community; is convinced that this danger can only be overcome by a considerably increased and more efficient commitment within Europe in terms of research and technology and draws attention to the greater proportion of gross domestic product spent on research in these two countries which is substantially higher than that spent in Member States of the Community.

5. Notes that technological dependence makes the European Community open to blackmail and exposes its trade and industrial policy to outside influences, as recently happened as a result of the US technological embargo;

6. Urges therefore that the European Community should have an independent research and industrial strategy;

7. Regards research policy as an important potential means of adapting to the transformation of society brought about by technological change;

8. Concludes therefore that the time is now ripe for a fundamental restructuring of research policy in Europe;

Priorities of a future European research policy

9. Therefore considers a fundamental reallocation of national and European programmes to be necessary in order to make better use of scarce resources;

10. Advocates extensive reductions in the research bureaucracy by transferring small-scale programmes making high administrative demands to the lower levels. Where small-scale programmes are shown to have a catalytic effect they should be continued subject to careful control;

11. Expects as great a reduction as possible, whilst being objectively justified, in the inflated advisory services of the Commission and the Council and requests the Commission to submit to the European Parliament within one year proposals for simplification of the advisory services;

12. Urges that large-scale research be put on a European footing since this will permit the consolidation of research and financing potential and ensure in an efficient manner that the results of research are disseminated widely with financing being borne jointly by all the Member States;

13. Expects and supports an extension of research-policy activities of the European Community beyond the field of applied research to that of basic research in subjects directly connected with the Community's objectives and requirements;

14. Considers the following fundamental aspects of agricultural research which has hitherto been underdeveloped in comparison with the Community's powers in the agricultural sector, as an important and legally viable means of intensifying applied research:

- further improvements in the quality of foodstuffs,
- reduction of the environmental impact by further developments in integrated plant protection,
- reduction of energy consumption in agriculture by such means as recycling and the development of biological nitrogen fixation techniques,
- research into and prevention of animal diseases,
- recognition of the role of nutritional science, also as a subject taught in universities, in the protection of consumers,
- study of the soil, with special attention to barren regions,
- genetic studies in relation to agriculture.

15. Recalls that agricultural research may greatly help to:

- reduce the dependence of Europe by decreasing its deficits in certain sectors (such as proteins, oils, tobacco, mutton and lamb, wood and so forth);
- reduce surpluses by enabling them to be processed;
- revitalize insufficiently developed regions in which projects are clearly of necessity a priority (such as the Mediterranean regions and Ireland);

16. Considers it essential, if European industry is to survive in competition with industries in the rest of the world, for a development and research policy to be an integral part of the Community's economic and industrial policy.

17. Recognizes microelectronics and informatics, maritime exploration, space and aeronautics, transport, biotechnology and energy as especially dynamic areas of research of fundamental importance for technological development in European industry; hopes therefore that pilot projects will be set up, around which to coordinate, as far as possible, national research;

18. Requests a purposeful assessment of the applicability to everyday life of the results of military research;

19. Considers that even in the short term promising opportunities for cooperation in European industry are to be found at the pre-competitive stage; and believes that, particularly at that stage, it is useful to encourage the establishment

of the Community undertakings referred to in Article 45 of the EAEC Treaty;

20. Expects that this cooperation and the activities of the European public research organization will lead to the establishment of a European 'scientific area' and better integration of national programmes, if possible, towards Community objectives;

21. Calls, to the same end, for increased mobility of researchers through large-scale further education and study programmes and incentives; in this connection care must be taken not to neglect the problem of social security;

22. Calls on researchers to make active use of the opportunities which already exist within European exchange programmes;

23. Stresses the need for coordination of private and public research objectives with priority being given to the choice of policy at European level;

24. Considers that when new research objectives are being established and steps taken to implement them, researchers must perform an advisory function;

25. Regards questions of nuclear, biological and chemical safety, which by their very nature assume a trans-frontier dimension, as manifestly constituting an area where research should be organized at European level;

Tasks of the Joint Research Centre

26. Urges that the next multi-annual programme for the Joint Research Centre (JRC) should be used to make is specifically qualified as a research centre for safety in high-risk industrial activities in the nuclear, chemical and biological sectors;

27. Recommends that the most import research sectors should be identified and determined and that the funds of the centres which are most advanced in those sectors should be increased as a result;

28. Calls for financing of the high flux reactor at Petten to be secured beyond 1984;

29. Welcomes the progress made by the JRC in the production of hydrogen using a thermo-chemical circuit and insists that a larger demonstration plant be constructed at ISPRA as soon as possible;

30. Calls for the continuous provision of unrefined information on the progress of work on the Super Sara project so as to assess the effectiveness of the Commission's work and reserves the right to take its findings into account in the annual budgetary procedure;

31. Recognizes coordination and amplification of national research as a further activity of the JRC, which should set up representations at national research establishments for that purpose;

32. Recommends the exchange of personnel between national research establishments and the Joint Research Centre;

33. Considers it essential to organize this research as a technological advisory service that will also address itself to the need to overcome the cultural difficulties of technology transfers, and will help with the timely preparation of Lome III, having regard to the European Community's special responsibility to the ACP-States;

34. Insists that research in the interests of the Third World should be conducted on the spot, provided this is practical having regard to the nature of the programmes and, if appropriate, in addition by coordination and liaison between national universities and research centres;

35. Advocates with immediate effect the highest possible organizational autonomy for the JRC, which should not only have a coordinating role in specialized fields, but be competitive with other research institutions and be given such international liaison authority as may be necessary;

36. Expects the Commission to submit the next multi-annual research programme before the end of 1982 so as to leave sufficient time for consultation;

Responsibilities of the European Parliament

37. Undertakes, should the next multiannual research programme be submitted late, to take the initiative itself before the end of 1982;

38. Calls for the joint monitoring of European research activities by its Budgetary Control Committee and Committee on Energy and Research to be stepped up, and stresses the vital importance of this function, especially in areas of high-cost research, such as JET;

39. Advocates regular contacts with the staff of European research establishments;

40. Expects its delegations - in particular those to the USA, Japan, Canada, India and Latin America - to appoint rapporteurs on research matters who will hold regular exchanges with the relevant specialist committee;

Requests to the Commission

41. Calls on the Commission to supplement its previous efforts by bringout out an overall report, to be updated at regular intervals, on the research policy of the major industrial world groupings (USA, USSR, Japan, EEC), so as to improve the basis of assessment and the potential for correction and anticipation in evaluating its own research policy;

42. Requests the Commission to limit administrative expenditure on research and development projects to the amount strictly necessary;

43. Calls on the Commission to include investigation of the social impact of technology in the industrialized countries as one of the research objectives of the Community;

44. Requests, for this purpose, and to strengthen the potential scientific community, an improvement in the dialogue between scientists, and between science and the lay public, and recommends a cheap edition of a 'European research handbook' as an important contribution to this end;

45. Calls on the Commission to adjust Community research, having regard to horizontal policy areas (regional policy, small and medium-sized undertakings, Third World), in order to help eliminate existing divergencies (and prevent large-scale industry from deriving any unfair advantage);

46. Rejects the creation of new Community research centres, but is in favour of cooperation agreements between the Commission and existing national research establishments. These should include the identification of key areas in specific fields of research to facilitate the division of work. Account should be taken of experience and specific geographical factors;

47. Expects the Commission to take steps to involve itself in the shaping of external scientific relations of the Member States, and to coordinate and guide them;

48. Insists on a Treaty amendment that will break with the existing ad-hoc basis and anchor research policy firmly in the EEC Treaty with clear allocation of responsibilities;

49. Expects in this connection that the role of the European Parliament as an institution of political decision-making and control will be clearly defined so as to remove Community research from an area where Parliament has no effective influence and to endow it with the necessary legitimation;

50. Calls on the Commission to submit the relevant proposals for the amendment of the Treaties, pursuant to Article 236 of the EEC Treaty, Article 204 of the EURATOM Treaty and Article 96 of the ECSC Treaty;

Requests to the Council and the Member States

51. Calls on the Council, as part of the joint budgetary authority, to approve the re-allocation of budgetary appropriations within the Community budget in favour of research;

52. Calls on the Member States to increase their research efforts to at least 2.5% of their gross domestic product;

53. Calls on Member States to ensure that scientific experts, users of research and industrial representatives are more directly involved than national civil servants in representing the Community's interest in research matters;

54. Believes that each President of the Council of Research Ministers should visit the sites of the Joint Research Centre during his period of office;

55. Believes that the Council of Research Ministers should meet more frequently and spend more time developing Community research policy and the coordination of Member States' policies instead of devoting its agenda to ad hoc research programmes.

56. Calls on the Member States to coordinate their research more closely and to pool selected projects at European level so as to save money and improve the efficiency of research;

Forwarding instructions

57. Instructs its President to forward this resolution to the Commission and Council, and to the parliaments and governments of the Member States.

B

EXPLANATORY STATEMENT

The Common Research Policy - problems and prospects

I. Introduction - The triple challenge

1. European research policy faces three major challenges in the early 80's.

- the dramatic rise in the cost of research exacerbates the budgetary problems in the national states and the Community. Economies will have to be made by redistributing national and European responsibilities for research. This report recommends that the major research projects, both in basic and applied research, should be largely transferred to the European level.

- Europe must develop ways of dealing with the industrial challenge from the USA and Japan. Research must play a part in this. The Japanese and Americans are ahead not so much in terms of basic and applied research as in their ability to channel research findings into the industrial process as part of an integrated industrial strategy. Since research has become a tool for modernizing our economy in many areas, we cannot allow research to be conducted at the European level in some areas while production and marketing in general remain nationally organized. Hence the proposal that a European industrial strategy should evolve from a European innovation policy. Europe must take advantage of the size of its markets. A European industrial strategy would not necessarily exclude cooperation with the USA and Japan.

- Research policy must not be regarded as a mere business tool. Research findings need to be viewed in their social, economic and structural context. We often lose sight of the fact that we are experiencing a period of exciting discoveries in the history of science which point to new approaches in thinking. Recognition of the finite nature of natural resources and scientific insights have shown that mankind cannot manipulate nature at will. Man is part of nature. This gives rise to a new view not only of physics but also of the behaviour of social systems. Europe is on the threshold of a secular cultural upheaval. It is not enough to respond to this challenge by, say, posing the question 'nuclear energy: yes or no?'; an adequate response can only be achieved within given economic limitations. The European Community must bear its full share of responsibility here.

These three challenges mean that European research policy must be prepared to adopt a fundamentally new approach. Although this approach will be based on what has gone before some adjustments will be necessary.

2. The following considerations and conclusions relate to the research policy of the Community and its Member States. The subject of this study is the future division of labour between national and Community research. Particular attention is given to the severe financial constraints which now apply.

3. The report is confined to public research expenditure. The rapporteur is however aware that private firms too are playing a considerable part in research and development projects. The firms are mainly interested in market-linked developments. But the large companies are increasingly also conducting basic research and thus have a major influence on the progress of scientific discoveries. Consequently, a separate study might usefully consider and evaluate that portion of European research which is conducted by private bodies.

4. The basic research conducted by the large companies mainly takes place in the fields of information science, electronics, chemistry and energy. The multinational oil companies play a special role and are in the process of using their huge profits to transform themselves step by step from vertically organized oil groups to horizontally integrated energy companies. This increases their influence over international events. Because of their international activities, the multinational companies are also gaining a growing influence over technoligcal developments in the less industrialized countries.

5. If the European Parliament is to concern itself with European research policy, it is important to stress and investigate particularly those aspects which fall within or should fall within the Community's sphere of responsibility. This report is no substitute for any of the detailed studies of European research policy nor is this its aim. Instead it seeks to provide a sober analysis as the basis for practical proposals on the future form of Community research policies.

6. Research policy moves within a given socio-political framework, and public debate on it ranges between two extremes:

- either the State simply establishes the basic parameters and subsequently encourages research by means of tax incentives
- or research policy is seen as an instrument of structural policy and controlled by direct financial transfers.

At the European level this controversy virtually disappears as the Community is unable to provide tax incentives. European research policy is therefore conducted with direct financial encouragement by the Community. Such control is however only possible on an ad hoc basis. As a result the allocation of research resources is generally not subject to intra- Community competition, despite the use of tendering procedures. Perhaps the Commission's ability to control this

process has been overestimated. Particularly in the case of indirect promotion of programmes, a major degree of decentralization to national or regional public authorities would generally be preferable.

7. Research represents man's intellectual confrontation with his own nature, and that of the outside world. This relationship between man and nature has left a very deep mark on European cultural history. It crops up again in the debates on the ecological movement and the movement away from linear progress. Although this debate is not new, it is currently dominating public discussion probably more than ever in the past. No European research policy which does not simply take the technocratic view but seeks to contribute to cultural history, (which, of course, it always does in one way or another), can evade this issue. Nor can the debate be reduced to a matter of technology assessment.

8. Science has lasting effects on culture, the economy, society and education. And conversely the general direction, scale and assessment of scientific activity are determined by our own systems of values and financial capacity. The more we become aware of this reciprocal relationship, the more clearly defined is the desire to promote orderly interaction between science and society. We need scientific discoveries to understand the totality of our existence, but at the same time we do not wish to be shackled by scientific constraints. Scientific activity should therefore be based on an exchange between the general public and those engaged in scientific activity in the more restricted sense. It should be transparent and open to inquiry and criticism and scientists themselves should have more say in the shaping of research policy.

9. We are not only facing new technological challenges, but are also experiencing a profound cultural crisis. Concepts and values upon which our society has been based for centuries have been brought into question or made obsolete by reality. The natural sciences have played a major part in this process, but without being able to offer new values and patterns of behaviour. Nor, of course is this the task of science, at least in its strictest sense, but we nonetheless have an obligation to reflect on the crisis in our culture. European research and scientific policy must therefore include the totality of our existence in its considerations. Far more importance should be attached to the social sciences and humanities than in the past. In the long term, Community research will also have to embrace this field.

10. European culture, in particular the scientific and technological civilization of Europe, has had a lasting influence on the cultures of other continents. It was from Europe that the exact sciences, and in their wake the technological society based on a division of labour, started their triumphal progress round the world. To a certain extent this was also true of the philosophy of the world which went with them. Concepts such as the nation,

democracy and socialism were absorbed by other cultures and given concrete form. But we are now finding that the non-European nations are having tremendous difficulties in applying these concepts to their circumstances and integrating them into their traditional systems of values. Counter-movements have emerged resulting in aggression and incomprehension. Islamic fundamentalism is only one, albeit perhaps the most obvious, form of resistance to European culture. At the same time we Europeans too are searching for a new identity. But we can only find a role in the world in interaction and solidarity with other cultures. Surely the European Community is the ideal institution to assist in this search for our cultural role in the world, to pose the questions and supply the answers. The Community should not simply become an instrument for industrial self-assertion but should seize the initiative in tackling the greatest challenge to civilization in our history. Perhaps people in Europe are so unenthusiastic about the Community precisely because it has failed to act in the sphere of cultural policy. Anguished questions are being asked about the ethical integration of technology and no answers are being given.

11. In every country of the Community there is a growing desire to comprehend technology in terms of human nature. Profound fears have been generated by the opportunities presented by discoveries in nuclear physics, military technology, information technology and genetic engineering. We are all confronted by more than a philosophical problem; we have become aware of the boundaries of our planet, and have observed that not only our intellectual life but also our very existence, our food and health depend on how we cope with technology.

It is no longer enough to recognize all the potential uses of technology; we need to reflect on the function, relative importance and impact of technology. Here too the Community has obligations which it cannot escape. We need an ongoing, structured dialogue on the technological civilization. This also applies to technology transfer to the Third World. In the context of development policy we need information on the socio-cultural impact of various development strategies.

II. Basic parameters: Member States' spending and their approach to Community research

12. In 1979, in the Community of Nine, public research expenditure totalled 16,700 million EUA[1], at current prices, and in 1980 19,400 million EUA. The annual average growth rate in real terms between 1970 and 1979 was just 0.5%. West Germany, the Netherlands and Ireland had a higher rate of growth and in France, Italy and the United Kingdom it was lower.

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[1] Statistics supplied by CRONOS

Community research amounted in 1980 to 284 m EUA; in other words the Community share of total public research expenditure (EUR 9) was only about 1.5%. In some areas of research, however, it was far higher, which simply reflects the concentration of Community resources on a few areas of research.

13. A further problem is low utilization of appropriations by comparison with the levels of allocations in the budget for Community research:

TABLE I

Original budget allocation in payment appropriations (only Chapters 33 and 73)	of which carried forward	lapsed this year
1974	84 m EUA	14 m EUA	3 m EUA
1975	96 m EUA	22 m EUA	1.5 m EUA
1976	135 m EUA	33 m EUA	18 m EUA
1977	183 m EUA	70 m EUA	7 m EUA
1978	194 m EUA	100 m EUA	25 m EUA
1979	196 m EUA	76 m EUA	16 m EUA
1980	277 m EUA	110 m EUA	0.6 m EUA

14. The breakdown of public research appropriations in the Member States by individual sectors is shown in the following table:

TABLE II

Total expenditure by EUR 9 grouped according to objectives in %

	Chapter	1970	1975	1979	1980
1	Study and utilization of natural environment	1.6	1.8	2.3	2.3
2	Organization of human environment	2.7	3.1	3.5	3.4
3	Protection and improvement of human health	2.9	4.3	5.7	5.5
4	Production, distribution and rational use of energy	10.3	9.3	10.7	10.8
5	Agricultural productivity and technology	3.1	3.6	3.7	3.5
6	Industrial productivity and technology	11.3	10.6	8.5	8.6
7	Problems of social coexistence	1.9	3.0	3.0	2.8
8	Space research and exploitation	4.3	4.3	4.1	4.0
10	General promotion of research	36.2	37.5	33.9	32.3
	Total expenditure for non-military R & D	74.1	77.5	75.1	73.6
9	Defence	25.9	22.2	24.4	26.4
	Miscellaneous	-0.2	0.3	0.2	0.2
	Total R & D expenditure	100.0	100.0	100.0	100.0

Source: CREST/1233/80

This shows that:

- the proportion accounted for by military research is rising again
- research with industrial objectives is losing ground.

15. Over 80% of the Community's research expenditure is accounted for by three countries - West Germany, France and the United Kingdom. The remaining 20% is mainly accounted for by Italy and the Netherlands (see table)

TABLE III

Public R & D expenditure

	1979 figures at the then current prices and exchange rates (in m EUA)		1980 figures at the then current prices and exchange rates (in m EUA)	
	total	non-military	total	non-military
F. R. Germany	6308	5572	6753	6068
France	4542	2938	5299	3365
Italy	923	895	1303	1268
Holland	1049	1017	1125	1090
Belgium	469	467	520	518
United Kingdom	3135	1459	4139	1894
Ireland	57	57	61	61
Denmark	243	242	217	216
EUR 9	16726	12646	19417	14480
European Communities	238	238	284	284

TABLE IV

	Annual rates of change for totals at 1975 prices and exchange rates (in %)							
	70-73	73-77	77-79	70-79	70-73	73-77	77-79	70-79
	total				non-military			
F. R. Germany	10.0	-3.5	6.1	2.9	12.4	-3.7	6.6	3.7
France	1.8	-2.8	3.7	0.1	-0.2	-2.0	0.2	-1.0
Italy	-1.5	-1.4	4.8	-1.4	-1.7	-1.2	5.5	-1.4
Holland	1,2	1,7	0.9	1.2	3.8	1.9	0.5	2.2
Belgium*	1.5	-1.8	(-9.9)	(-2.9)	1.6	1.9	(-9.9)	(-2.9)
United Kingdom	1.6	-1.6	-2.0	-0.7	0.7	-3.2	-5.7	-2.8
Ireland	10.0	3.3	7.2	6.2	10.0	3.0	7.2	6.2
Denmark	5.4	-0.4	-3.2	0.8	5.4	-0.6	-3.1	0.8
EUR 9	4.0	-3.4	3.5	0.5	4.3	-2.3	1.6	0.9
European Communities	-5.5	17.7	-1.0	5.3	-5.5	17.7	-1.0	5.3

*The figures in brackets take account of the methodological adjustments made in 1978

16. Military research accounts for approximately a quarter of total research spending. In the United Kingdom it accounts for over half.

TABLE V

Defence expenditure as % of total research expenditure

Country	1970[1]	1975	1979	1980
United Kingdom	41.0	46.4	53.5	54.2
France	35.9	29.8	35.3	36.5
F. R. Germany	17.7	11.0	11.7	10.1
EUR 9	25.9	22.2	24.4	26.4
[1] estimated				

Even if research in the defence sector has spin-offs in other areas, it is nonetheless true that the Community of Nine is neglecting non-military research to the benefit of military research. It is particularly important to consider whether military research is likely to be pursued even more intensively in future given the general deterioration in relations between the major powers. In the rapporteurs view any growth in the level of military research is to be deplored.

17. If we compare the Community with the United States and Japan, the following picture emerges:

	total non-military research spending divided by GDP	public non-military research spending divided by GDP
Community	1.7	0.7
USA	1.7	0.5
Japan	2.0	0.8

Thus Japan for example invests 10 to 15% more in non-military research than the Community (relative to its GDP).

18. The breakdown of research spending by the Member States of the Nine according to objectives is as follows:

(see table on next page)

This shows that expenditure on energy research in the Community represents approximately 40% of the expenditure on research into defence.