COMMISSION OF THE EUROPEAN COMMUNITIES

COM(82) 493 final

Brussels, 4 August 1982

STIMULATING THE COMMUNITY'S SCIENTIFIC AND TECHNICAL POTENTIAL

Experimental phase : 1983

(Communication from the Commission to the Council)

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CONTENTS

Introduction.

In its communication to the Council of Ministers of 9 November 1981 (1) , the Commission emphasised the need for a common research and development strategy. This would involve strengthening and widening the scope of the programmes policy followed up to now by means of an activity to stimulate the scientific and technical potential of the Community, which would be integrated within the General Framework Programme for Community R & D.

Following requests by the Council on 9 November 1981 and 8 March 1982 the Commission restated, in its communication to the Council dated 8 June 1982 (2) the need and the value of a Community stimulation activity, while at the same time making clear what was at stake, clarifying the objectives and setting out the operational arrangements.

The discussion held by the Council at its meeting on 30 June 1982 recognised the extent to which the analysis and diagnosis of the usefulness of an increased effort to stimulate european science and technology was well founded. At the same time the Council recognised that there was an opportunity to develop a stimulation activity as a complement to existing activities (national, international or at Community level).

On this basis the Council invited to Commission to set out the details of the outline plan of the stimulation activity which is to form part of the Framework Programme 1984-87. This outline plan will be put before the Council in November 1982.

The Commission was also asked to put forward the areas and operational principles to be adopted for the pilot phase (1983) which would make it possible to try out the specific approaches and mechanisms for such an activity. That is what this communication sets out to do.

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(1) COM (81) 574 final "Scientific and technical research and the European Community - proposals for the 1980s"

(2) COM (82) 322 final - "Stimulating the Community's Scientific and Technical Potential"

A) A COMMUNITY STIMULATION ACTIVITY.

I. Value

I. 1 The value of a Community activity :

The European Economic Community has an overwhelming need for scientific research which is both strong and effective. As the greatest commercial power in the world, the Community can only guarantee continued social and economic progress by strengthening its competitiveness, both agricultural and industrial/commercial. Today, more than ever before, this level of competitiveness is a function of the scientific and technical strength which is available, of the quality of research teams and the outlets for action and development to which they have access.

The Community is strong on 'grey matter', and its capacity to invent and to innovate is considerable and of high quality. Nevertheless, as the Council recognised, too often the real value of the spinoffs from the significant scientific and technological research carried out by the Community is limited by certain constraints or mismatches.

Given this problem, the Member States of the Community have undertaken a number of measures to boost the efficacy of their scientific and technical research at national, international or Community level.

On the basis of the analysis carried out by the Commission (1), the Council recognised the value of strengthening and supplementing these measures by a Community activity which would make it possible to get the best out of them by opening up the Community dimension as a field of activity.

I. 2 Value of the Community dimension :

So far as "new" issues are concerned, the critical scale necessary to the successful development of R & D work will be reached more easily if the skills now dispersed amongst various countries can be brought

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(1) COM (82) 322 final

together within an organised framework. Experience shows that mobility is easier to promote the wider the scientific and cultural space is. (1) In fact this intraeuropean mobility represents an excellent opportunity to put an end to the scientific isolation of the R & D systems of certain Member States. It is also a beneficial element in the cross fertilisation of disciplines, the diffusion of knowledge and the creation of replacement needs which serve as an outlet for young graduates. Thus all encouragement for mobility stimulates innovative research.

Research linked to a multidisciplinary approach to problems benefits from the multinational dimension in a special way; this is because at a multinational level it is much easier to get the many and varied perspectives which modern science needs in order to bring together the complementary elements to solve a given problem.

A wider field of activity increases the freedom of action which is needed by the partners concerned in order to orientate the research or exploit its results. Thus it is that the introduction of innovations is easier in a more varied and extended market ; at the same time the solution to a problem may sometimes be found by developing knowledge gained elsewhere without having to set up a full scale research programme.

I. 3 Value of a complement to Community R&D activities in progress :

The stimulation activity corresponds to one of the goals of the common strategy and forms an integral part of the Framework Programme. It therefore represents an essential complement to programmed sectoral activities by making it possible to organise the kind of specific, fast and flexible activities which are indispensable to any R&D strategy.

By their multi or interdisciplinary nature, and being both multisectoral and not rigidly programmed, stimulation activities make it possible to strengthen Community R & D programmes within their own fields by opening new avenues to cross fertilisation and the development of promising new developments. Some of the most valuable elements of the stimulation activity will lie in the ability to spot needs and opportunities quickly, to react rapidly without the constraint of fixed term planning, to test or verify hypotheses prior to the preparation of any major programmes or projects, or of medium term programmes, and to improve the mobility of personnel and the interchange of ideas. The adoption of the Framework Programme will make these even more important.

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(1) Study "Employment prospects and mobility of scientists in Europe",ESF,1980.

Lastly, this complementary activity will make it possible to build up the Community's capacity to spot and exploit promising European scientific and/or technical developments, which might otherwise be taken advantage of elsewhere.

II. General guiding principles

The efficacy and success of a stimulation activity at Community level are dependent on the observation of three fundamental imperatives :

- to conceive and develop these activities in close collaboration with the people concerned and who have an interest (researchers engineers, industrialists and people responsible for R&D at the national level) whilst making sure they are coherent with national or Community R & D activities.
- to be able to move quickly from the preparation of a Community activity to its implementation by using teams of recognised quality.
- not to build up new national or Community structures or infrastructures : thus the development of new research centres or the creation of a new researchers body is not envisaged, nor is it intended to give financial support to teams which could lead to a permanent commitment.

The areas of Community intervention are discussed during examination of the Framework Programme for Community R & D activity. Within these areas the field of activity can easily range from basic research to the most applied, or to the development of technology. Particular attention will be paid to the strengthening of interaction between the world of research and that of the social partners by opening up the possibilities for a meeting point between scientific resources and socio economic needs.

In the chosen fields, and in due observance of the imperatives listed above, the operations to be undertaken and the teams who will have to carry them out will be chosen with regard to their quality, the benefit which can be anticipated from the Community dimension, the value to the Community and lastly the possibilities they present of building up poles of excellence.

III. Operational arrangements

The operational arrangements for implementing the Community stimulation activity were presented to the Council on 30 June 1982 (1).

They can be summed up as follows :

- with the aid of appropriate consultations with the scientific and technical communities, the Commission would select those scientific and technical areas where a stimulation activity would seem to be particularly necessary and important, taking account of the objectives of the Framework Programme, objectives which reflect the interests of the Community. The Commission would state the resources needed for the stimulation activity. So far as the preparation of the experimental phase 1983 in particular is concerned, the Commission has drawn upon the previous work and deliberations of CERD (the European Research and Development Committee) whilst holding consultations as appropriate.

- Following discussion of this question by the Council and taking account of the resources devoted to the stimulation activity, the Commission would inform scientific and technical communities at national level of the possibilities which are open. This information will be made available through national institutions and directly, through the medium of advertisements (Official Journal, publications, etc...). At the same time proposals would be invited.

- In response, requests for intervention would be sent to the Commission. These might be either spontaneous or prompted, and arise from multiple sources (individuals, teams, national or european organisations) in order that the multivariate potential which exists within the Community can be stimulated to the greatest possible extent. The basic requirement is that applications arise from, be to do with or aim at the formation of multinational teams.

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(1) COM (82) 322

- The choice of tenders would be made by the Commission which would make use of a 'peer review' system to this end, similar to that used at the moment to assess work or a scientific publication. The final choice would be made as a function of the level of excellence of the tender and the principles set out in section II.

Once the activity and the team to carry it out had been chosen, Community intervention would take the form of an appropriate form of financial support, with a time limit, which would be given to the selected collaborators. (this could be in the shape of research allocations, subsidies for laboratory "twinning", development contracts or conferences).

Evaluation of these activities and dissemination of their results would be carried out in the framework of the procedures used by the Commission for Community R&D activities.

B) EXPERIMENTAL PHASE 1983.

1. Aim

The Framework Programme covering the period 1984-1987 will include a group of stimulation activities (objective number 7 of the Framework Programme) forming an outline stimulation plan for implementation, in the same way as the various theme plans, from 1984 on. These stimulation activities will call for appropriate procedures and intervention arrangements, which will need to be original by comparison with the range of Community approaches and resources which are available and which have been used for years to implement Community scientific and technical programmes.

It would be useful therefore to try out the procedures and operational arrangements specific to stimulation. During the experimental phase the Community stimulation system would be tested and perfected on a reduced scale with illustrative interventions.

2. Operational arrangements

The system of assessing needs and scientific and technical consultation will be arranged during 1983. It will be organised around CODEST (Committee for the European Development of Science and Technology) which the Commission will set up at the end of 1982 to replace CERD (1).

At the same time, in 1983, the Commission would carry out several model activities, on the basis of assessments and studies which have been undertaken, especially during the last few months, in fields where, in connection with the goals of the Framework programme, a need for stimulation has been highlighted.

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(1) See COM (82) 322 final : CODEST is a consultative committee responsible to the Commission, made up of personalities of recognised standing in the scientific and/or technical fields, active within national research and development systems and aware of national policies. The Commission would see to the selection of members, taking particular account of suggestions which might be put to it by the scientific and technical community and the governments of the Member States.

These areas would be where the principal approaches and methods of intervention would be put to the test, for example

- Research allocations:
  Payment of an allocation to cover the travel, accomodation and research expenses of scientists who, during a stay at a laboratory in a different country (within the EEC) would apply new knowledge to research into a complex problem or provide additional support to a team of 'less than critical' size.

- Workshops/seminars :
  Contributions to the diffusion of the most up to date knowledge available, and to the development of contacts between researchers.

- Twinning of laboratories in different countries :
  Making it possible for researchers who, in the various countries of the Community now work, as it were, in parallel within an advanced field, to reach 'critical mass' by working together. For this to take place there would need to be a subsidy to allow researchers to meet, to undertake joint experiments and exchange results.

- Developing multidisciplinary and multinational projects :
  Making it possible, via development contracts to bring together the best available specialists in various countries and disciplines so as to achieve a predetermined objective.

Within selected fields tenders would be invited from the national scientific and technical communities, who would have been kept informed of the proposed Community action. After these tenders had been evaluated, in consultation with referees the Commission would select and follow through those which would be the most appropriate for trying out the Community stimulation procedures and intervention methods, and which would also display the greatest value bearing in mind the Community's scientific and technical goals.

So as not to anticipate any follow up which the Council might wish to give to this experimental phase, the Commission would support activities to be undertaken by researchers attached to a research body or institute, within the framework of existing national structures.

3. Detailed plan of action

Taking account of the goals of the general Framework Programme and the objectives set for the experimental phase of stimulation (1983), the Commission has selected a certain number of scientific and/or technical fields where a stimulation activity is to be undertaken. In these fields multi- or interdisciplinary activities carried out jointly at multinational level should make it possible not only to test the approaches and methods for stimulation, but also to stimulate the scientific competitiveness of the Community and to open up avenues of development which have a direct socio-economic value.

3. 1. Fields of activity

3. 1. 1 Pharmacobiology : application of new developments in cellular and molecular biology

This area concerns the application of advanced knowledge in the field of cellular and subcellular biology (eg. the structure and function of cellular receptors in subcellular organelles) to problems of pharmacology (particularly pharmacokinetics and pharmacodynamics, specific activity tests, etc.).

Increased support to major work already being carried out in a number of sectors could facilitate the development of new therapeutic systems whose value to the Community would be considerable both at the human and the socio-economic levels.

3.1. 2 Solid state physics : structure phenomena and processes of fabricating composite materials

The simultaneous development of mutually reinforcing knowledge at both the theoretical and experimental levels could lead to the perfection of reliable, safe and economic new technologies for the fabrication of composite materials which would have predefined and controlled characteristics.

3.1. 3 Optics : application of modern techniques of mathematical analysis to various problems in the field of optics

Use of mathematical models to explain accurately certain practical realities could lead to promising technological developments in various sectors (especially lasers and binary memories).

3.1. 4 Combustion : approach to ignition phenomena (behaviour of material under combustion conditions)

New knowledge in other fields of research make a new approach to these problems of ignition possible. The control of these phenomena would lead to technical progress of considerable interest in a number of sectors (performance of motors using hydrocarbons, safety of hydrocarbon storage locations).

3.1. 5 Photometry/photoacoustics : application to the field of non destructive analysis

On the basis of knowledge now available the strengthening of work in progress should lead to the development of new technologies for non destructive analysis and hence to perfecting original instruments.

3.1. 6 Interface phenomena

The simultaneous development of theoretical tools to approach these phenomena, and knowledge deriving from experiments should facilitate progress in many sectors (eg. biomembranology, chemical engineering) and could lead to valuable application in various technologies (especially biomaterials, adhesive techniques, spontaneous emulsification and tertiary recovery of oil).

3.1. 7 Climatology : transitory phenomena

A multidisciplinary understanding of these phenomena would be of great value in a number of respects, particularly in tackling problems of erosion, encroachment of desert areas or drought.

3. 2 Scientific and technical activities concerned.

In these fields three kinds of activity will be given priority support :

- Activities for which the joining (whether mono or multidisciplinary) of research teams is beneficial or indispensable. Joining up within disciplines will be an attempt to bring together teams working in the same discipline but in different countries. Such collaboration should in certain cases make it possible to reach the "critical mass" which is needed for the creativity of each team to take off. Interdisciplinary links would seek to bring together teams in different disciplines, often located in different countries. Both methods aim to exploit the richness of the methods and results now dispersed through Europe.

- Activities making it possible to promote high quality teams which because of the novel character of their work do not yet benefit from the support which their worth and the potential value of their work might justify.

- Activities leading to a reinforcement of the communication and dissemination of information within the scientific and technical system.

3. 3. Nature of activities.

Following the consultations which were carried out in order to devise the experimental phase (cf p.5) and in the light of advice received by the Commission from experts active in the areas involved, the Commission intends to test the various stimulation modes which can be envisaged by

implementing the following methods in each of the selected areas as a matter of preference :

3. 3. 1 Pharmacobiology : application of new developments in cellular and molecular biology

Award of research allocations (1) to researchers from various countries of the Community, spread amongst laboratories located in several countries of the Community, whose specialities (in such fields as surface receptors, monoclonal antibodies, cell culture, organic chemistry and biochemistry, industrial biotechnology, pharmacology and therapeutics) should when brought together encourage the success of research into a joint objective.

3. 3. 2 Solid state physics and technology of composite materials. Analysis of combustion phenomena and ignition dynamics - Photometry and photoacoustics applied to non destructive analysis. Interfacial molecules, physical chemistry.

Grant of "twinning" (1) allocations to laboratories spread amongst various countries of the Community and subsidies reinforcing available resources.

3. 3. 3 Studies of transitory phenomena in climatology and geology.

Support for multidisciplinary meetings and workshops to assist the diffusion of the best available knowledge within the various disciplines of relevance to the problem, and to build up contacts between researchers of different countries.

3. 3. 4 Optics.

To carry out a multinational and multidisciplinary operation (a 'project') with the aim of achieving an optonic binary memory. In order to do this it will be necessary to draw up a contract with the multinational group of teams which puts forward the best project so as to provide them with the chance of joint working whilst having the necessary extra resources available. The choice of operational arrangements in the various sectors is based upon the illustrative effect they might have. Bearing in mind the tenders which will be put to the Commission those choices might be reexamined if the illustrative nature of the tenders was even greater.

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(1) see the details of such interventions p. 8

4. Anticipated financial implications (experimental phase 1983)

a) Testing approaches and methods of stimulation

. research allocation (1) (number of researchers involved : 20 p.a.)	1.600.000 ecus
. laboratory 'twinning' (1) support for joint working (number of laboratories concerned : about 12, i.e. around 30 researchers p.a.)	600.000 ecus
. setting up by specialists from various countries of a body of knowledge available in several areas, the assembly of which is needed in order to approach a given problem (workshop) (1)	100.000 ecus
. undertaking a scientific and technical operation with a predetermined aim in view and for which a multi-disciplinary and multinational working group is needed	2.000.000 ecus

b) Activities with the aim of setting out the details of the outline stimulation plan 1985-1988

. seminars, studies to establish the "state of the art" in a given science or technology	300.000 ecus

c) Administrative support, management

	400.000 ecus
Total	5.000.000 ecus

Note : amount put to the budgetary authority by the Commission in the framework of the preliminary draft budget 1983

(1) see details of such interventions p. 8

CONCLUSION.

The Commission requests the Council to adopt the resolution attached as an annex , so that this experimental phase may be undertaken in 1983 to set up and try out the Community's approaches to and methods of stimulation.

ANNEX TO THE COMMUNICATION TO THE COUNCIL

DRAFT

Resolution of the Council
meeting on .....
concerning the implementation of a Community activity
to stimulate the efficacy of
the Community's scientific and technical potential

The Council of the European Communities,

having regard to the Treaty establishing the European Economic Community,

having regard to the proposal from the Commission,

Whereas, by its resolution of 14 January 1974 dealing with the coordination of national policies and the definition of activities with Community interest in the field of science and technology, the Council entrusted the Commission with the task of defining activities of Community interest and selecting the approaches and methods appropriate to the implementation of these activities;

Whereas the implementation of a common strategy in the field of science and technology constitutes a feature which is of benefit to social and economic progress, balanced growth and an improvement of the quality of life in the Community;

Whereas the Council of Ministers (9 November 1981) and the heads of state or of government, meeting on 26 and 27 November 1981 declared the need to develop Community scientific and technical research in the framework of an overall strategy in order to support the different policies of the Community and of Member States;

Whereas the overall Community strategy derives from the conception and implementation of a general Framework Programme of common scientific and technical activities;

Whereas amongst the fundamental goals proposed by the Commission for the Framework Programme and favorably received by the Council of Ministers (8 March 82) that of 'improving the Community's scientific and technical efficacy' calls for special modes of intervention;

Whereas there is a need to have, within the Framework Programme (as a medium and long term planning tool) the use of specific means of intervention for stimulation and pilot projects making it possible to retain the flexibility, speed and sharpness which is indispensable to any scientific and technical strategy;

Whereas there is a need to support and boost the efficacy of the Community's research and invention capacity;

Whereas, without a strengthening of the efforts to stimulate science and technology which are already taking place at the national and Community level, and without taking advantage of the benefits conferred by the Community dimension to do so, Community science and technology cannot progress in the best possible conditions;

Whereas the Council, meeting on 30 June 1982, recognised the value of a Community stimulation activity to supplement national and international activities already in existence and that the Commission should set out which areas and operational arrangement should be selected for a preliminary experiment during which the specific approaches and methods for such an activity could be tried out;

Whereas CREST gave an opinion on this proposal the .....

Adopts the following resolution

1) The Council regards with favour the programme of action proposed by the Commision as set out in the annex, in the context of which the latter proposes to undertake a preliminary group of activities to stimulate the Community's scientific and technical potential. These activities will basically make it

possible to test approaches and methods of Community intervention and to set out the overall Community stimulation plan.

The annex forms an integral part of this resolution.

2) The Council similarly acknowledges favourably the intention of the Commission to specify as soon as possible, together with the draft Framework Programme, the outline stimulation plan for the years 1984-1987.

On the basis of the outline which is subsequently decided the stimulation plans for each year will be founded, the Council formally approving them on the occasion of the annual examination of the Framework Programme.

ANNEX

PROGRAMME OF ACTION FOR STIMULATING THE COMMUNITY'S SCIENTIFIC AND TECHNICAL POTENTIAL

Since certain negative features constrain the creativity and efficacy of the Community's scientific and technical potential, even though this potential constitutes an important factor in facing up to the challenges of the 1980s, the stimulation of Community's capacity for research and invention forms a vital element of the Community's scientific and technical strategy. In the framework of this strategy a Community stimulation effort will make it possible to supplement and to strengthen similar activities already undertaken by enabling them to take advantage of the benefits conferred by the Community dimension.

To this end, and with a view to trying out the special intervention approaches and operational methods for this kind of activity, it is intended to undertake a group of stimulation activities during an exploratory phase lasting one year. This will also make it possible to set out the details of the annual stimulation plans for 1985-1988 which will be incorporated into the General Framework Programme for Community scientific and technical activities.

The experimental test activities will relate to activities of a multi or interdisciplinary nature for which joint working at a multinational level is necessary or preferable. This phase will not prejudice future decisions on this subject.

To achieve the objective the programme of action is set out as follows :

1. Three kinds of activity are to be given priority support :

   - activities for which the joining up (whether mono or interdisciplinary) of research teams is beneficial or indispensable. Union within a discipline would be an attempt to bring together teams working within the same discipline but in different countries. Such collaboration should, in certain cases, make it possible to attain the critical mass which is needed in order for the creativity of each team to take off. Interdisciplinary union would seek to link teams

working within different disciplines, often located in different countries. Both methods aim to exploit the richness of methods and results now dispersed throughout Europe,

- activities enabling the promotion of high quality teams which because of the novel nature of their work do not yet benefit from the support which their worth, and the potential value of their work, would seem to justify,
- activities leading to a strengthening of the communication and diffusion of information within the scientific and technical system.

These activities would involve in the main the following seven areas :

- pharmacobiology : application of new developments in cellular and molecular biology,
- solid state physics : structure phenomena and processes of fabricating composite materials,
- optics : application of modern techniques of mathematical analysis to various problems in the field of optics,
- combustion : approach to ignition phenomena (behaviour of material under combustion conditions),
- photometry/photoacoustics : application to the field of non destructive analysis,
- interface phenomena,
- climatology : transitory phenomena.

2. In these fields different kinds of illustrative stimulation activities are to be tried out : research allocations, laboratory training, seminars or workshops, subsidies for research teams. On the other hand a specific project of a multidisciplinary nature will be started up, to enable joint working by teams in different countries to bring it to successful conclusion.

3. The choice of stimulation activities and the scientific and technical teams involved will be made as follows :

   - the Commission will inform the national scientific and technical communities of opportunities for Community intervention in the selected fields, and in the expectation of receiving tenders,
   - the selection of tenders will be made by the Commission which, with the assistance of a consultative committee, will make use of a "peer review" system to judge the scientific and technical merit of the activities proposed and the quality of the teams putting them forward. The interventions chosen will possess a multinational character (mobility of researchers from one country to another, teams made up of researchers from various countries of the Community, projects carried out jointly by various teams in various countries of the Community, etc.) and will involve activities of the type set out in para. 1 of this annex. These activities will be complementary to and coherent with Community scientific and technical activities carried out elsewhere.

4. A group of studies, consultations, surveys, seminars etc., carried out in collaboration with the scientific and technical community will make it possible to analyse and evaluate the scientific and technical needs and opportunities with a view to specifying the content of the annual stimulation plans incorporated in the Framework Programme.