

COMMISSION OF THE EUROPEAN COMMUNITIES

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RESEARCH PROGRAMME (1983 - 1987)

FORECASTING AND ASSESSMENT IN SCIENCE AND TECHNOLOGY

(FAST)

(Communication from the Commission to the Council)

COM(82) 855 final

STATEMENT OF OBJECTS

"The Commission shall assess the result of the programme and report to the Council and to the European Parliament at the end of the fourth year".

(Art. 4 of the Council decision of 25 July 1978 concerning a programme of research on forecasting and assessment in science and technology)

1. The FAST Instrument : FUTURES RESEARCH IN THE SERVICE OF COMMUNITY R & D STRATEGY.

The increasing role of science and technology in national development and in international economic relations demands a major and continuing joint Community effort in R&D. This must be selectively directed : a choice of medium and long term objectives being made within the framework of a Community R&D strategy, including the definition of the resources necessary for its implementation.

Such was the basic reasoning which led the Community in 1978 to implement and test an "instrument" for selecting the broad directions of Community R & D policy.

The main function of the experimental FAST programme has been to test the usefulness of futures research and assessment as a tool for the definition of long-term Community R & D objectives, thus contributing to the development of a coherent long-term science and technology policy at Community level.

As stipulated in the Annex to the decision of Council of 25 July 1978, the FAST programme has sought to fulfil this role through :

- a/ the analysis of existing research activities in forecasting and assessment within the Community and elsewhere, with a view to their interest for the development of the Community's science and technology policy;
- b/ highlighting the prospects, problems and potential conflicts which might affect the long-term development of the Community, and hence proposing alternative directions for R & D actions at Community level related to these needs;
- c/ the establishment, in cooperation with the Member States, of an ad hoc system of collaboration between specialist research groups within the Community, and hence the creation

of a number of Community forecasting networks.
The networks should be as flexible and informal as possible.

Highlighting the Community's long-term prospects, problems and potential conflicts was carried out on the basis of three major study themes :

- a/ WORK AND EMPLOYMENT
Key problem of the 1980s
- b/ THE "INFORMATION SOCIETY"
Major change of the next 20 years
- c/ THE "BIO-SOCIETY"
One of the major changes of the next 30 years.

Thirty-six research studies were carried out, involving some 60 research teams from Member States of the Community (*). These themes also served as bases for the development of the ad hoc co-operative networks.

2. RELEVANCE AND USEFULNESS OF THE RESULTS OF THE PROGRAMME.

Balanced assessment of the experiment leads to the conclusion that the idea proposed by the Commission, which the Council wished to prove, is operational : the instrument can work.

The FAST studies have certainly not covered all fields of scientific and technological change. Moreover, there have been some shortcomings and limitations encountered in the execution of the programme, due inter alia to the complexity of the subjects treated and the ambitious objectives pursued. Similarly, various of the conclusions or recommendations may require further debate and revision.

Nonetheless, the results of the programme constitute a relevant response to the objectives set, and an important contribution to the identification of new long-term directions for R & D (**).

As a process, the FAST programme has already served as a stimulus to long-term deliberation and "stirring" of ideas both within the services of the Commission, and in the European scientific community, through

- the choice of topics (such as, for example, biotechnology and the Third World; life-styles and new information technology; the future of service employment; man-machine "mis-matches"; prospects for the "environment industry";)

(*) The FAST team itself comprised 10 staff (6 researchers), with total programme resources of 4.4 m. écus from the Community budget, supplemented by 1.2 m. écus from public and private agencies in the Member States to co-finance the research studies.

(**) In support of this, see : - final advice of the FAST-ACPM
- report of the Evaluation Panel of independent experts.

- the approach adopted (seeking to include the industrial, economic and societal dimensions, thus going beyond the exclusively "technological" approach to the analysis of scientific and technological change)
- the opportunities for ad hoc and informal cooperation encouraged around the research themes. (Co-finance of studies, organisation of seminars, colloquia, workshops, etc....)

The programme also served to stimulate new initiatives, as in the case of the studies known as Long Lead Time R & D in Information Technologies, which gave rise to the ESPRIT programme.

As products, the FAST programme has led to a series of good quality reports (some of which have already been used by the Member States or by the Commission services), to a useful identification of the long-term issues and orientations for R & D, and to a series of specific proposals for R & D action. In addition to these concrete results, the programme has usefully demonstrated the close relationships between scientific, technological, industrial, economic and social challenges and objectives; as well as the interdependence at operating level between R & D actions, technological innovation and social innovation.

3. THE SEQUEL TO FAST : GUIDING PRINCIPLES

The reasons which in 1978 justified the adoption of the experimental programme have increased in their weight and significance. For the analysis of the implications and consequences of scientific and technological changes for the countries of the Community and their policies has become an ever more vital task : escape from the crisis through the mobilisation of science and technology is the major imperative of the 1980s.

The escape route is narrow, but neither unique nor pre-determined : hence the need for multiple efforts, in various places and by various ways, to identify the opportunities, the options and the possible choices.

The FAST activities should be pursued, and the existing instrument increased in its effectiveness, by a new 4-year research programme based on the following guiding principles :

● Continuity in the main theme :

The main theme remains that of "horizontal" analysis (multi-dimensional, multidisciplinary) of long-term technological change. Benefitting from the experience acquired in the past four years of activity, this analysis should further investigate and enlarge our understanding of the changing relations between science, technology and society, and of the resulting future challenges to the policies of the Community not only in R & D, but in agriculture, energy, industrial, economic and social affairs.

The FAST activities will thus make a significant contribution to the continuing elaboration of the "programme framework of the scientific and technological activities of the Community". At the same time, based on scientific analysis and a long-term perspective, they will provide an important means for the integration of research with other Community policies.

O Development and renewal of the research themes

The future research themes cannot yet be finalised in detail (*) but four broad fields for investigation can be identified on which future FAST studies could focus, bearing in mind the economic and industrial use and application of R&D studies:

1. New forms of "growth" for Europe
2. New strategic "industrial" systems
3. The allocation of activities within the life-span, and its implications for production.
4. The transformation of service activities and technological change.

The explanations given below of the thematic content of these four fields are given as a preliminary basis, serving as point of departure for further work on the definition of the research themes of the programme.

1. NEW FORMS OF "GROWTH" FOR EUROPE

To emerge from the current crisis by repeating the growth of the 1950s and 60s is impossible : we have to develop new forms of "growth", mobilising science and technology for this purpose. This is one of the major problems of European societies in the closing decades of this century, one of the challenges which confronts in particular the European research system.

In this perspective, two themes for long-term studies are offered :

O Transformation of the relationship between technology, work and employment

A new generation of machines, of systems and of networks, is progressively pervading the industrial, economic and social fabric. What will be their consequences, in the medium and long-term, particularly on the problems of work and employment? The intention is to develop further certain studies carried out within the "Work and Employment" and "Information Society" themes, concentrating more closely on the transformation of man-machine relationships, and in this context, on the forms of work organisation and implications for training.

O Integrated development of renewable natural resource systems

There is increasing interaction and integration, in terms both of technologies and of products, between agriculture, silviculture, the agro-food industry, biomass energy, chemicals, the environment, and water resources. These interactions raise fundamental questions

(*) It will be for the Commission to arrive at a clear definition of the fields of study, in co-operation with the new ACPM and the national research centres.

of the use of land and of renewable natural resources, at local, national and Community level. The resolution of such questions demands at European level the joint use of the various areas of expertise in the Member States, innovative R & D (focussing on integrated systems rather than on individual outputs), and coherent long-term strategic vision embracing several fields.

2. NEW STRATEGIC INDUSTRIAL SYSTEMS

The encouraging results obtained by the pilot programme in certain sectors suggest the further pursuit of this type of study, but broadening it to the concept of an "industrial system"; thereby taking fuller account of the network of inter-connections, and reflecting better the inter-penetration of areas of knowledge and technologies. Under this title, the industrial communication system (oral, written, audio-visual, computerised, satellite-based ...) would be one appropriate topic; as would the systems focussing on the concept of "habitat". These long-term studies will focus specifically on the interactions between developments in separate but closely inter-dependent sectors.

3. THE ALLOCATION OF ACTIVITIES WITHIN THE LIFE SPAN AND THE IMPLICATIONS FOR PRODUCTION.

The numerous options arising from new technologies lead to possibilities for the reorganisation of the allocation of activities within the life-span, presenting individuals, groups and institutions with problems of fundamental significance, albeit as yet scarcely perceived:

- o How is one to prepare, in professional, family and social terms, for a life in which the periods of time spent at school, in factory or office, and in the home, are being restructured and increasingly intermingled?
- o What are the limiting factors associated with the various options, the adaptive capabilities (for example, in biological terms), the possible margins for manoeuvre, in terms of human beings, institutions, and technological possibilities?
- o What would be the consequences for working life and productive activities, and hence for Community research?

4. THE TRANSFORMATION OF SERVICE ACTIVITIES AND TECHNOLOGICAL CHANGE

This concerns the development of a field of research hitherto left fallow. It is frequently stated - no doubt with reason - that service activities will be at the core of transformations in work and employment over the coming twenty years. It therefore seems reasonable to suppose that in the field of services as in manufacturing, there will appear an international division of labour. What will be Europe's position in such a development? The challenge is a considerable one, the more so since services are already constituting one of the key meeting-points of technological and social innovation. Thus this offers a particularly wide field for innovative Community R & D.

O A new balance of activities and working methods

In accordance with the suggestions made in the evaluation of the FAST programme, the following changes are proposed :

a/ reduction of the burden of managing contract research, in order to improve the quality of working links with the contract researchers, and to undertake more research and analysis work "in house",

b/ reinforcement of the "network" role. For this purpose :

- the ACPM will be closely involved in the definition and implementation of the studies, and will be enlarged to include a wider range of societal interests;
- the programme will establish co-operative links with some ten small national research units (at least one in each Member State). For an activity like FAST, a system based on 10 x 10 researchers is more effective than a system of 1 x 100;
- a desirable feature will be the secondment to FAST, for the execution of short-term, ad hoc studies (3 to 18 months) of researchers, project leaders from Member States, and colleagues from other services of the Commission;

c/ reinforcement and clarification of the functional links between FAST activities and the relevant services of the Commission (the "correspondents" formula might be replaced by an "inter-service FAST group" of senior staff).

O Still with modest resources

An assessment of the resources necessary to implement the new programme leads to the following :

- o scientific personnel of 11 staff (grade A)
- o technical and executive support staff of 8 (3 grade B, 5 grade C);

The increase in personnel relative to the first programme is required mainly for the development of the "network" function, a particularly demanding activity, as has been shown by the experimental programme, as well as by the increased weight given to in-house research.

o credits amounting to some 1,2 m. écus p.a., to finance the network activities, the contract researches and the various costs associated particularly with the "visiting fellows".

Given the above, and adding to these costs those of personnel, (about 1,4 m. écus p.a.) the sum estimated to be necessary for the total period of the programme (1983-87) is 10,5 m. écus.

The average annual operating cost in 1982 values would be just over 2 m. écus p.a. For comparison, the operating cost of the experimental programme during its period of full activity (September '80-April '82) was around 1,8 m. écus p.a.

CONCLUSION

The Commission proposes to Council the adoption of the draft decision attached hereto, relating to a new FAST futures research programme, for the period from 17 August 1983 to 31 December 1987.

DRAFT COUNCIL DECISION

adopting a research programme of the European Economic Community on forecasting and assessment in science and technology (FAST), 1983-87

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community and particularly Articles 235 thereof;

Having regard to the proposal from the Commission;

Having regard to the Opinion of the European Parliament;

Having regard to the Opinion of the Economic and Social Committee;

- Whereas Article 2 of the Treaty assigns to the Community the responsibility, inter alia, for promoting a harmonious development of economic activity in the whole of the Community, and a continuing and balanced expansion and accelerated raising of the standard of living;
- Whereas the mobilisation of science and technology constitutes one of the possible mechanisms for stimulating a resumption of growth in the countries of the Community;
- Whereas by its resolution of 14 January 1974, relating to the coordination of national policies and the definition of actions of Community interest in the field of science and technology, the Council charged the Commission with the task of defining actions of Community interest and of selecting the ways and means appropriate to the implementation of these actions;
- Whereas research and development activities, integrated in an overall concept of social and economic policies, have become one of the essential strategic means for realisation of the long-term objectives of the Member States and of the Community;
- Whereas one of the instruments for the regular revision of the programme framework for Community R & D and the adjustment of its priorities in response to current and foreseeable developments is the analysis of possible long-term scientific, technological and socio-economic changes;

- Whereas the Council, by its decision of 25 July 1978 (*), approved a research programme of the European Economic Community on forecasting and assessment in science and technology, designed to test, over a four-year period, the usefulness of such an activity for the selection of broad long-term directions for Community R & D, and whereas this programme ends on 16 August 1983;
- Whereas the results of the aforesaid programme, known as FAST, have demonstrated the inherent usefulness and particular need in these difficult times of reflective study of long-term scientific, technological and socio-economic developments in the countries of the Community as a basis for the definition of long-term objectives and action priorities, particularly in science and technology;
- Whereas the effective utilisation at Community level of the results of significant forecasting and assessment activities in science and technology carried out in the Member States, by various new public and private research agencies among others, requires the reinforcement and multiplication of co-operative European networks;
- Whereas the Treaty does not envisage the specific powers required for this purpose;
- Having regard to the opinion given by the Scientific and Technical Research Committee on the Commission's proposal

DECIDES :

Article 1

The Council hereby adopts a second research programme of the European Economic Community on forecasting and assessment in science and technology, as defined in the Annex to this resolution. The programme shall be from 17th August 1983 to 31st December 1987.

Article 2

The estimated requirement for funding the execution of this programme amounts to 10,5 m. écus including the expenses associated with a staff of 19. The écu is defined in accordance with the financial regulations in force. These figures are indicative only.

Article 3

The Commission shall be responsible for the implementation of the programme. It shall be assisted in this task by an Advisory Committee on Programme Management to be set up by the Commission.

(*) Official Journal No L 225 of 16 August 1978 (p. 39)

Article 4

The Commission shall inform the Council and the European Parliament by two interim reports (mid-1985 and at end of 1986) on the state of progress of the research activities.

The Commission shall evaluate the result of the programme and shall make a report to the Council and to the European Parliament at the end of the programme.

Article 5

The diffusion of knowledge resulting from the execution of the programme shall be in conformity with (CEC) regulation no 2380/74 of 17 September 1974, establishing the procedure for the diffusion of knowledge relating to the research programmes of the European Community (1).

(1) Official Journal no L 255 of 20/09/1974 p.1

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A N N E X

Research programme of the European Economic Community on
"Forecasting and assessment in science and technology
(FAST)" (1983-87)

1. The main aim of the FAST research programme is the analysis of scientific and technological changes in order to highlight their long-term implications and consequences for the Community's R & D and other policies.
2. The activity will concentrate on four main fields of investigation :
 - o New forms of "growth" for Europe, in particular
 - transformation of the relationships between technology, work and employment;
 - integrated development of renewable natural resource systems;
 - o New strategic industrial systems
 - o The allocation of activities within the life-span, and its implication for production
 - o Transformation of service activities and technological change.

These are general thematic axes. The specific research projects will be defined in cooperation with the ACPM and the research units mentioned in point 4, bearing in mind the industrial and economic utility and application of R&D studies.
3. To achieve the aim defined in point 1, the programme has two principal tasks in the 4 areas envisaged in point 2 :
 - a) to highlight the prospects, problems and potential conflicts which may affect the long term development of the Community, and hence to propose new long-term orientations for Community action, particularly in the field of science and technology,
 - b) to make use of long-term research studies undertaken within the Member States.
4. The execution of these tasks will be mainly through the following modes of action :
 - o development of the activity of the programme on the basis of a network including some 10 national research units, the form and functioning of which will be defined with the units themselves, in cooperation with the Member States,
 - o association of Community centres or research teams with capability in the analysis of technological change, in the execution of specific themes of analysis,

- o promotion of ad hoc networks for information and collaboration at Community level. These networks to be as flexible and informal as possible. The participation of representatives of industry, labour and associated movements to be sought,
- o secondment to the programme by national and Community institutions (governmental, academic or professional) of "visiting fellows" for the execution of specific tasks of short duration (3 to 18 months).

A N N E X E S

1. EVALUATION PANEL REPORT
2. ACPM ADVICE
3. EXTRACT FROM THE DRAFT MINUTES OF THE CREST MEETING IN COPENHAGUE (30/10/1982) INFORMATION AND EXCHANGE OF VIEWS ON THE RESULTS AND RECOMMENDATIONS OF THE FAST PROGRAMME

The Evaluation of the Community Programme on Forecasting and Assessment in the Field of Science and Technology (FAST)

(1978 - 1983)

Research Evaluation Report n° 6
(Preliminary edition)



EUR 8274 EN, FR

COMMISSION OF THE EUROPEAN COMMUNITIES

Directorate General XII
Brussels

S U M M A R Y

EVALUATION OF THE FAST PROGRAMME: THE MAIN FEATURES

1. In July 1982 the Commission instructed a group of seven independent outside experts to examine the results of the Community's first research programme on forecasting and assessment in the field of science and technology (FAST programme, 1978-1983).

Their terms of reference were to assess how far the objectives of the programme had been attained, to determine whether the structure of the programme was appropriate to its purpose, to estimate the quality of the work done, to evaluate the usefulness of the results, to examine the efficiency of the management of the programme and to make recommendations for future work.

2. The group delivered its report at the end of October after holding numerous interviews and examining all the studies completed under the programme, in particular the draft final report. Its main conclusions are briefly outlined below.

To put them into context, the following points must be borne in mind:

- those responsible for the programme had decided to concentrate on three themes: the biotechnologies, the information society and work and employment;
- they spent much of their resources on contractual research;
- in the final report they had set out the main results of the programme and made proposals on its continuation;

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- in accordance with their terms of reference, they had attached great importance to the setting up of information networks concerning the subjects tackled by FAST either in the Member States or within the Commission.

EVALUATION OF THE STRATEGY FOLLOWED IN CONDUCTING THE FAST PROGRAMME

3. In assessing the strategy followed in conducting the programme it must be borne in mind that the terms of reference were extremely wide, ambiguous about the objectives and the "decision-makers" to which the message was addressed and yet did not protect the FAST team from any pressure (implicit or explicit) from those around them to gradually narrow its sights so as to avoid encroaching on the sphere of other directorates and to deliver a product that could be used immediately by DG XII. The experimental nature of the first stage of the programme should also be borne in mind.
4. The FAST team was right to concentrate its efforts on a small number of themes. The three themes selected are important and it would have been difficult to choose better ones. As regards "work and employment", the evaluation group feels that it would have been better to tackle all its aspects rather than confining the work to employment-technology relations that might well not be relevant if economic phenomena and in particular price and cost determination methods are left out.
5. The FAST team endeavoured to study the links between social requirements and research and development programmes, a vital but difficult field on which little work has been done. The emphasis on this area and the international nature of the programme are the two great original features of FAST.

The methodological approach followed had several advantages: a very open call for proposals, the development of genuinely international thinking,

the putting to good use of existing work, great flexibility in respect of the horizons considered and the discovery of important topics.

On the other hand the methodological approach had certain inadequacies as regards the synthesis of results: the lack of any overall conceptual framework, insufficient quantified evaluations in the final report, the weakness of the economic interpretations, the gulf that sometimes exists between analyses and proposals, and the insufficient transparency and prospective nature of the methods used. These criticisms do not in any way detract from the advantages of the approach and merely show that it would be preferable to adopt a more balanced approach in the second programme.

EVALUATION OF THE THREE THEMES

6. In general terms:

- (1) The overall standard of the contractual research in the FAST programme is more than satisfactory.
- (2) It is absolutely essential to distribute widely several research studies that are of outstanding quality and have not yet been published.
- (3) Some of the research should be continued under the FAST II programme.
- (4) The energetic way in which the FAST team followed up contracts and took part in the research is undoubtedly one of the reasons for the excellent overall quality.

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- (5) Nevertheless, the research projects suffer fairly frequently from an imprecise definition of their scope, deficient conceptualisation, a weak methodological approach, and recommendations that are inadequately backed up.
 - (6) The FAST team spent too much of its budget on contractual research and the breadth of the contractual research activities forced it to spend much time on managing this programme and to reduce the volume of research done by the team itself.
 - (7) A large number of "forced" marriages between teams with different orientations were neither fruitful nor harmonious. It would have been better to entrust each project to a single team or to a team acting as project leader and free to choose associated centres in the other countries.
 - (8) Most of the shortcomings mentioned above could easily be corrected in the framework of the second programme.

EVALUATION OF THE PROGRAMME RESULTS

7. All the members of the evaluation panel wish to emphasize that the final report underlines the enthusiasm and high standard of the work of the FAST team. However, the presentation of this document could be improved by the team over the next few months. The many different objectives addressed by the final report make it too heterogeneous and it would perhaps be better to replace it by several separate documents.
8. The FAST proposals should already be of real use to the Commission and the Member States Governments although it is a pity that they are rather scattered, not always sufficiently justified and sometimes lack boldness. Also FAST appears on the whole to give

preference to public sector projects, which in some cases may be politically unacceptable or economically undesirable.

EVALUATION OF THE PROGRAMME'S LIAISON NETWORK

9. In accordance with its terms of reference, the team responsible for the programme has made a real effort to set up and put into operation networks of outside research centres interested in the fields covered by FAST.

Nevertheless, despite the successes achieved, the outside networks set up by the FAST team are still fragmentary and fragile. It is extremely important that what has been achieved in the first stage of the project should not be lost in transition to the second stage. Consequently in general terms the evaluation group suggests:

- that funds be devoted to the regular operation of networks that are not confined to contract holders,
- that sustained contacts be established with forecasting and assessment centres of national governments (members of these teams could be seconded to FAST),
- that contacts be made with research teams outside the Community.

10. As far as the Commission's internal network is concerned, the evaluation group is convinced on the basis of its interviews that the FAST team has made a real effort to communicate and that its members have a good image in the other departments. Nevertheless, the FAST team's internal network is still flimsy, suggestions on this subject are set out below in the recommendations for the continuation of the programme.

PROJECT MANAGEMENT AND RESOURCE ALLOCATION

11. The programme timetable shows that the real work was concentrated in a three-year period and allowance must be made for this when the results are evaluated. The personal competence of the members of the permanent team is beyond question, even though a higher level of industrial and economic expertise would have been desirable. The team put in a considerable amount of work.

The contracts were properly managed and the contractors were carefully selected. In future a general reserve should be set aside initially to allow for changes of emphasis in the work, the extension of contracts or the preparation of policy proposals. The role of the "complementary budgets" supplied by national organisations was not completely clear to the members of the evaluation group.

RECOMMENDATIONS ON THE CONTINUATION OF THE PROGRAMME

12. The evaluation group unanimously takes the view that the FAST project should continue, for the following two reasons:

- (1) The considerations underlying the Council's approval of the launching of FAST I in 1978 are still fully valid.
- (2) The first experimental stage of the programme may be regarded as successful both because it yielded a number of interesting proposals and because the shortcomings found should be fairly easy to correct in phase II.

Consequently, the evaluation group proposes that the FAST programme be renewed for a further five-year programme and that fresh resources at least equal to those for the first programme be allocated to this second phase.

13. The aims of the second phase could be as follows:

- to identify certain implications and consequences of technological change on Community policies,
- to detect relevant fields for Community R&D and examine ways of improving the bringing of research results into the market place,
- to carry out year-by-year prospective studies that would provide guidance for the research conducted in the Community when it relates to themes selected by FAST.

14. As far as the proposed research activities are concerned (man and the living environment, man and machine, strategic industrial systems and services over the next twenty years), however interesting they may be, the evaluation group expresses reservations on their wording because (i) insufficient emphasis is placed on the continuity that must exist between the first and second phases of the project, (ii) there is a danger of being too ambitious, (iii) there is insufficient emphasis on the desirable link between FAST II and some aspects of the five approaches proposed by FAST I, (iv) the research activities are not sufficiently graded into general research, evaluation research and follow-up activities.

15. With regard to working methods and funds, it is essential to increase substantially the proportion of resources going to the team's own research, even though substantial research under contract must be continued and the networks maintained; it would be useful to strengthen the industrial and economic expertise within the programme; the team should be increased in size (by secondment and part-time advisers rather than by recruitment).

16. As to the status of the team, it seems preferable for the time being (without ruling out subsequent attachment to a higher level) to keep the FAST team in its present place in the organizational chart. However, to ensure that the thinking of the FAST team is not increasingly confined to the area covered by DG XII defined restrictively (which would gradually deprive the project of much of its value) and to ensure that the other Directorates-General make a contribution to the FAST programme and are fully informed about its progress, the following possibilities should be studied:

- (1) the setting up of an advisory council chaired by the Director-General (DG XII) and attended by sufficiently high-ranking members of all the Directorates-General concerned,
- (2) the seconding of members of other Directorates-General to the FAST team for limited periods and specific research projects,
- (3) the entrusting of research projects of common interest to joint teams composed of members of FAST and of another Directorate-General.

Appraisal by the Advisory Committee on Programme Management (ACPM)
of the FAST Programme

After introducing briefly the role of the FAST ACPM, this paper discusses four points :

- o the mandate
- o the FAST experiment
- o the results, and finally
- o FAST II

1. The FAST ACPM

The ACPM was established as an advisory group for the Commission. The individual members were nominated by the Governments of the Member States. The Committee has held a total of 11 meetings, and has been involved both in the selection of the FAST team and in the execution of the work. Thus the work programme was established in close co-operation with the ACPM, as was the allocation of contracts.

The work of the ACPM was not limited to the 11 full meetings, but also included meetings of sub-committees. The sub-committees related specifically to the individual sub-programmes (*), and hence had contact with the project contractors. In some countries, national committees were established to relate to the FAST programme. The ACPM has actively supported the FAST team in the organisation of conferences and presentations. One might describe the relationship between the FAST team and the ACPM by the term "Co-operative assistance". Nonetheless, throughout the 4-year co-operative working the FAST team has ensured its independence and intellectual integrity. On its side, the ACPM has expressed itself freely and openly, providing both criticisms and suggestions in the progress of the work.

2. The Mandate

The Council of Ministers' decision in July 1978 defined three tasks of the FAST programme :

- a) Analysis of existing forecasting and assessment activities
- b) Investigation of problems and potential conflicts likely to influence the long-term development of the Community. Definition of alternative options for Community action in the field of research and technological development.

(*) see next page

c) Development of informal co-operation between research centres in the Member States. Exploitation of this network for FAST activities.

These three tasks could not all be completely fulfilled. In particular, it proved impossible to develop an informal network without concrete specific tasks.

It was therefore decided, in agreement with the ACPM - given the unsuccessful attempts to fulfil all three tasks with a small team - to concentrate the work upon the second collection of tasks. A process of selection led to the definition of three sub-programmes, which were then the object of intensive investigations:

- o Bio-Society
- o Information Society and
- o Work and Employment

Task a) in the mandate as described above was not comprehensively undertaken, but was executed only within the three sub-programmes. Task c) also was only partially fulfilled. Key roles of the informal network were the project contractors of the three sub-programmes. It was only in the final phase of the programme that the network - particularly through conferences, workshops and presentations - was progressively developed and used.

In conclusion, it may be said that a beginning was made upon all three tasks of the mandate. The major effort of the work, however, was clearly devoted to task b).

3. The experiment

The ACPM is of the opinion that as a whole the FAST experiment has been successful. Substantial contributions have been made to the goals defined in the mandate. On the other hand, the ACPM is of the opinion that the exploitation of the knowledge gained in the experiment, i.e. its implantation in Community policy, will be possible only to a limited degree. The reasons for this are not, however, to be sought in the FAST team. The limited possibility of implementation lies much more in the inherent complexity and scale of the problems investigated. The value of the FAST experiment will thus lie not primarily in its implementation in concrete R&D programmes at Community level, but rather in the important stimulus given to various other areas. These stimuli, which can be derived from the FAST experiment, do not in the ACPM's opinion necessarily mean new programmes with new and enlarged budgets for the advance of research and technological development. More important appear to be the following initiatives and suggestions, which the FAST experiment offers:

- o suggestions for long-term objectives and orientations ;
- o suggestions for new forms of collaborative work ;
- o demonstrations of the evolutionary changes within, and cross-linkages between, individual areas of policy ;
- o problem analyses as aids to decision.

The FAST experiment has already shown results in some countries and led to the strengthening of strategic long-term planning.

The FAST experiment, in the general view of the ACPM, should be considered and evaluated not as an end in itself, but as part of a process.

4. Results

The final report is based in its essentials on the studies, conferences and workshops carried out, as well as on in-house work. These activities are in themselves sound contributions, and some research reports are of high value. They have been in many cases of direct use to different "clients" of the programme. Collectively, they provide a solid basis for the report.

The results of the three sub-programmes differ in their nature, because of the different problems considered and their complexity. The 11 long-term strategic issues which have been extracted from these programmes, if they are considered in isolation, do not provide any new basic knowledge. These results alone would not justify the 4.4 MUA expended. The particular value of these long-term strategic issues lies in the demonstration of the manifold cross-linkage and evolution of the changes between and within the sub-programmes investigated. In comparison with national investigations, the areas particularly treated were those appropriate for Community activity and new forms of joint collaboration. From the 11 strategic issues identified, five key points for R&D policy at Community level were identified (pp. 210-228 of the report) :

- o consolidation and renewal of the European industrial system around two axes "Agriculture - Chemicals - Energy" and "Space - Electronics" ;
- o conception and development of the european wide infrastructures for new service activities in the next 30 years ;
- o adaptation to the transformation of employment and establishment of new man-machine relationships ;
- o stimulation of the science and technology needed for the solution of certain major problems of the countries in the Third World and the development of their "local" scientific and technological potential ;
- o development of the necessary and essential knowledge to facilitate the joint mastery of technological changes ;

The first four tasks in particular, considering the possibilities for further activity discussed above (e.g. forms of joint collaboration or linkage between sub-programmes) are recommended for further pursuit. The fifth suggestion needs further critical discussion, particularly with a view to the real possibilities for institutions to influence technological change.

Another type of results derives from the fact that a programme like FAST is also a process. Accordingly, the existence of FAST has made possible or enhance some activities within the Commission's services in the field of information technologies (ESPRIT for example), of biotechnologies (interservices "task force"), of energy prospective ("Energy 2000" exercise) to mention a few.

It has, least but not last, through contacts with more than 1000 European scientists and researchers, helped to stimulate the appraisal of technological change in different institutions, organisations and research centres within the Member States.

5. FAST II

The FAST experiment, having initiated a fruitful process of learning and assessment, facilitates for the ACPM the definition of its views on FAST II. It recommends, on the basis of the experience acquired and the expectations expressed for FAST II, a continuation of the work. This continuation should, however, be based on a clear mandate, and following clearly defined time and cost schedules. The mandate should include three functions :

- o scientific work ;
- o collaboration in our external network ;
- o collaboration in our internal network ;

with the mission of multi-dimensional and multi-disciplinary analysis of long-term technological change and the objectives of :

- o highlighting the need for long-term oriented R&D and identifying possible new directions for Community R&D ;
- o highlighting the implications and consequences of technological change for Community sectoral policies.

In-house scientific activities are a necessary prerequisite for high quality and acceptance of the results. Joint collaboration with external centres appears necessary in view of the scale and complexity of the problems, and is preferable to a major enlargement of the staff in Brussels. Although

Appraisal by the ACPM
of the FAST programme

FAST II should conduct scientific work, the ACPM believes it to be necessary that it should be located within the Commission but not necessarily within the science area, the important thing being to recognise the several fields of analysis of different Directorates-General, and to have effective and efficient exchange of information with the other Services.

In a continuation of FAST it should be ensured that there is direct exchange of information with the various policy areas. But it should also be made clear in the mandate that FAST should work predominantly on the definition of long-term goals and priorities, and should not be drawn into short-term policy advice.

Regarding the content, four work themes are suggested. The ACPM's view is that the mandate should specify the process of defining the themes rather than the themes themselves. In the definition of the themes the collaborating partners should participate. The themes should certainly be linked to the work hitherto carried out by FAST. A newly constituted ACPM should carefully ensure that the necessary decision process for the selection of themes takes place within a defined period of time.

This completes the assessment and suggestions for the continuation of the programme; two further remarks are appropriate :

Firstly, a suggestion : the final report should be complemented by an easily understood, "user-friendly" short report, which can be given more widespread diffusion.

Secondly, a commendation : the FAST team has in the opinion of the ACPM accomplished an extremely exacting task with great commitment and high professionalism. This hard and successfully executed work merits unconditional appreciation.

Advisory Committee for Programme Management
of the FAST programme

INFORMATION AND EXCHANGE OF VIEWS ON THE RESULTS AND RECOMMENDATIONS OF THE FAST PROGRAMME

(Extract from the draft minutes of the CREST meeting at Copenhagen)

On behalf of the FAST team, Mr. Petrella presented the report of its activities, which describes the role of the FAST programme and the results obtained. These comprise on the one hand, the identification of situations and trends within the three major fields adopted for study (work and employment, information society, bio-society); and on the other, the resulting recommendations for long-term orientations of Community R&D policy. The report also puts forward some suggestions on the content and methods for a new FAST programme.

Mr. SCHULZ then conveyed the favourable opinion of the ACPM associated with the execution of the programme. He emphasised the complexity of the task accomplished, the ACPM would wish to see the programme continue within a clearly defined mandate, and with increased participation of external partners.

Mr. BUSINARO then reported to the Committee on behalf of the group of experts established to evaluate the results of the programme at the end of the 4th year, as envisaged. This group considers that the results are generally valuable and interesting, and this in spite of the mandate's ambiguous character and excessive breadth. In conclusion, the group recommends the prolongation of FAST, ensuring continuity with the preceding programme in terms of content, and with operating methods improved in the light of the previous experience. In particular, a greater recourse to external contributions appears desirable.

In the course of the subsequent exchange of views, the Committee generally acknowledged the interest and usefulness of the FAST studies.

Several delegations stressed the desirability of a shortened and simplified presentation of the studies, which would facilitate the use of the report.

Regarding the continuation of FAST, a clear preference was expressed for a second programme of traditional form rather than transformation into a permanent activity.

Some delegations emphasised the relevance of the FAST exercise to the preparation of the framework programme. Regarding the content of the second FAST programme, some delegations mainly wanted to see a development and more exhaustive treatment of the themes studied in the current programme. Regarding methods of operation, the Committee emphasised generally the desirability of closer cooperation with national centres (suggestions included decentralisation, association with national researchers, organisation of meetings and seminars). Also mentioned was the need to maintain closer contacts and links with other Community units responsible for the various sectoral policies.

COMMISSION OF THE EUROPEAN COMMUNITIES

FINANCIAL STATEMENT

COM(82) 855 final/2

Applies to the French, German
and English versions only

Brussels, 14 January 1982

RESEARCH PROGRAMME (1983 - 1987)

FORECASTING AND ASSESSMENT IN SCIENCE AND TECHNOLOGY

(FAST)

(Communication from the Commission to the Council)

COM(82) 855 final

RESEARCH PROGRAMME (1983-1987)

FORECASTING AND ASSESSMENT IN SCIENCE AND TECHNOLOGY

(FAST)

- PROPOSAL FOR COUNCIL DECISION -

FINANCIAL STATEMENT

FINANCIAL STATEMENT

1. Budget line

1.1 Programme title : Forecasting and Assessment in Science and Technology (FAST)

2. Legal basis

Article 235 of the EEC Treaty
Decision of Council of 25 July 1978

3. Programme definition

Object:

To analyse technological change in order to highlight their implications and consequences for long-term Community studies, and thus to contribute to the definition of orientations for R & D action.

To develop co-operative networks with the Member States, in order to make use of the work of the programme, and to stimulate similar long-term research in the Member States.

Description:

Various means will be employed, namely :

- studies and researchers undertaken by the scientific personnel of the programme;
- contract studies with research centres in the Member States;
- the organisation of colloquia, workshops, seminars;
- the use of experts seconded for a fixed period to the programme;
- the stimulation of Community networks, using inter alia a nucleus of some ten research units operating in the Member States, in cooperation with the programme.

The first months of the programme will be devoted, in close collaboration with the ACPM and the Commission services, to the precise definition of the research activities in the four areas proposed in general terms as follows :

- New forms of "growth" for Europe (in particular : transformation of the relationships between technology, work and employment, and integrated development of renewable natural resource systems)

- new strategic industrial systems;
- the allocation of activities within the life-span, and the implications for production;
- transformation of service activities and technological change.

4. Justification of the programme

The analysis of the implications and consequences of scientific and technological change for the totality of the countries of the Community is more than ever a vital task, at a time when the mobilisation of science and technology for the resumption of economic growth is becoming a major imperative.

In its reply to the Mandate of 30th May 1980, the Commission indicated its willingness to develop Community R & D in order to increase its capacity to respond to the major socio-economic challenges of the 1980s.

In its proposals for the 1980s (COM(81)574 final), the Commission envisaged in particular a prolongation and reinforcement of the current FAST team in order to give greater clarity in the preparation of its proposals and to ensure the complex synthesis required.

The proposal for a sequel to the FAST activities has been supported by the ACPM, by the programme's Evaluation Panel, and by CREST (see Annexes 2,3,4), in view of the positive results of the first programme, 1978-82.

Finally, the implementation of the general framework programme for the Community scientific and technological activities will include in particular some elements shaped by the advice of the FAST programme.

5. Financial implications

5.1 Nature of expenses

- personnel costs;
- research contracts and studies;
- seminars, workshops, conferences, organisation and operation of networks;
- costs relating to the reception of experts seconded by the Member States;
- missions, publications, documentation, administrative and technical operating costs.

Financial Statement

5.2 Total cost

10.500.000 écus at the expense of the Community
2.500.000 écus at the expense of third parties in the
Member States (enterprises, institutions, etc.)

5.3 Method of calculation

a) personnel costs

The staff proposed for this activity comprises :

- o 10 agents on temporary posts (6A/researchers + 1B + 3C) from 17 August 1983 to 31 December 1983
- o 19 agents (11A researchers + 3B + 5C) from 1 January 1984 to 31 Dec.'87

Their estimated cost is

- o 200.000 écus for the period in 1983
- o 1.200.000 écus for the year 1984 (*)
- o 1.300.000, 1.500.000 and 1.600.000 écus for the years 1985, 1986 and 1987 respectively,

i.e. a total cost for the whole programme of 5.800.000 écus.

The change to 19 staff from 1984 is to meet two basic management principles :

- o the adequacy of the means for the objectives held to be necessary and vital in order for the programme to give useful results. The development of the "network" function, for example, has by all parties been considered a priority and essential objective. Without the appropriate resources, such a development is unthinkable. The same is true for the other objectives of the programme.
- o efficient scale of operation : in the field here considered, a research unit has to remain of modest scale to be effective. A large unit runs the risk of bureaucratisation. However, a team of 11 researchers :
 - adequately ensures the necessary diversity of disciplinary skills and nationalities,
 - makes possible a good circulation of ideas and interactions, adding value to individual contributions,
 - favours "team-work", thus increasing the value and usefulness of the final outputs.

(*) On the basis that 1A = 75.100 écus, 1B = 47.100 écus, and 1C = 26.500 écus in 1983, including the reserve, and an allowance of 10 %.

(5.3) b) operating expenses

These comprise

- costs of stimulation and operation of the networks (including meetings, missions, seminars ...),
- costs of partial support for experts seconded to the programme,
- miscellaneous expenses (operations, publications, ACPM meetings),

amounting in total to 2,4 m. écus for the whole period of the programme (including an allowance of 100.000 écus for the remainder of 1983).

c) contract expenses

The amounts envisaged amount to 2.200.000 écus, 100.000 écus in 1983, and 2.100.000 écus for the whole of the following four years.

5.4 Multi-year schedules

Commitment credits ('000 écus)

| | remainder of 1983 | 1984 | 1985 | 1986 | 1987 | Total |
|------------------|----------------------|--------------|--------------|--------------|--------------|---------------|
| Personnel | 200 | 1.200 | 1.300 | 1.500 | 1.600 | 5.800 |
| Operations | 100 | 600 | 800 | 600 | 300 | 2.400 |
| Contracts | 100 | 1.200 | 700 | 200 | 100 | 2.300 |
| T O T A L | 400 | 3.000 | 2.800 | 2.300 | 2.000 | 10.500 |

Payment credits ('000 écus)

| | remainder of 1983 | 1984 | 1985 | 1986 | 1987 | 1988 and beyond | Total |
|------------------|----------------------|--------------|--------------|--------------|--------------|-----------------------|---------------|
| Personnel | 200 | 1.200 | 1.300 | 1.500 | 1.600 | | 5.800 |
| Operations | 100 | 600 | 800 | 600 | 300 | | 2.400 |
| Contracts | 50 | 750 | 700 | 600 | 100 | 100 | 2.300 |
| T O T A L | 350 | 2.550 | 2.800 | 2.700 | 2.000 | 100 | 10.500 |

5.5 Financing of expenditures

- a) The expenses envisaged for the remainder of 1983 are covered by an amount of 200.000 écus already in the 1983 budget under post 7.391.* The difference will be requested by means of a budget correction (200.000 écus commitment credit and 150.000 écus payment credit in 1983 and 50.000 écus payment credit in 1984).
 - b) The expenses foreseen for the follow-up of the programme are financed by credits to be written into the budgets for the years 1984-1985-1986-1987.
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6. Control

- a) Financial controls : by the competent services of the Commission, in particular by the D.G. for Financial Control, so far as concerns the regularity of the expenditures and the execution of the budget;
- b) Scientific controls : the competent services of the Commission, the Advisory Committee on Programme Management (ACPM), and in accordance with the general evaluation procedures of Community R & D activities.

* (Research staff awaiting assignment, 10 agents, 6A,1B,3C for the period from 17 August 1983 to 31 December 1983, coming from the programme "Long-term forecasting and assessment (FAST)").